

# OCEANOGRAPHIC VESSELS OF THE WORLD

A Joint Publication of  
IGY World Data Center A for Oceanography  
at the Agricultural and Mechanical College of Texas  
and the  
National Oceanographic Data Center

(Publication G-2 in the NODC General Series)

Printed by  
U.S. Navy Hydrographic Office  
Washington, D. C.  
1961

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## PREFACE

The relatively recent enthusiasm for greater knowledge of the marine environment by most maritime nations has brought about tremendous world-wide expansion in oceanographic efforts. This increased interest in the oceans is due to several factors. Governments are being forced to look to the sea as a source of food because of the "population explosions" in many countries. Depletion of mineral resources and the knowledge that vast stores of minerals can be found in the oceans has caused nations to investigate the possibilities of mineral extraction from this untapped source. The increased industrial and commercial contamination of the ocean and nearshore waters in the 20th century indicates the need for closer monitoring of wastes resulting from the disposal of industrial wastes and other pollutants in bays and estuaries as well as the deeper ocean expanses. And finally, man's continual quest for knowledge has enticed him to investigate the relatively unknown areas of his planet, the oceans.

This increased interest in the oceans has resulted in a great expansion of the world's oceanographic fleet. Formerly, various types of ships were used as they existed or were converted to perform oceanographic work. Today many of the oceanographic ships are designed with oceanographic research in mind. The fact that information on this continually growing fleet is not readily available prompted the U. S. Navy Hydrographic Office and IGY World Data Center A for Oceanography at Texas A. & M. College independently to begin preparation of publications on oceanographic ships. Subsequently, arrangements were made to combine the efforts of the two organizations to prepare a single publication, and the Hydrographic Office's responsibility for this work was transferred to the National Oceanographic Data Center.

The purpose of this publication is to describe the oceanographic vessels of the world, giving in detail, their specifications, their equipment, and their scientific capabilities. This, we believe, will provide an indication of the world capability to carry on observational programs in the oceans and will be of great help in the planning of international cooperative expeditions which now are becoming more frequent.

Much of our information was obtained directly from the various institutions operating these vessels. Questionnaires were completed and forwarded to us. When no questionnaire was received, we searched

the available source material but could not always obtain the desired information, or the information may have been obsolete. We realize, therefore, that in its first printing this publication will have some shortcomings, and it may not supply the best information in all cases. However, we intend to keep this publication up-to-date with the help of the user. It is requested that corrections, additional new material, and photographs be forwarded to the National Oceanographic Data Center, Washington 25, D. C. We will issue new pages or corrections periodically.

We wish to thank those nations, institutions, and individuals who made this publication possible through their cooperation in supplying us with the required information. We welcome future contributions from them and others.

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# INTRODUCTION

Thomas Wayland Vaughan in his International Aspects of Oceanography discussed the oceanographic vessels of the pre-World War II oceanographic research organizations of the world, thereby giving an indication of the research capabilities and potentials of some of the maritime nations. However, due to the tremendous expansion of facilities and concepts in the science of oceanography, his work is now obsolete in this respect.

In 1953, the U. S. Office of Naval Research published a comprehensive report entitled Oceanographic Vessels in the United States, which presented pertinent details and photographs on some 73 U. S. surveying and research ships.

There is no recent work which provides a complete picture of the major scientific vessels of the world. This publication attempts to do this. It is not intended to give details on all existing vessels known to have obtained oceanographic data inasmuch as this would include a host of support vessels whose primary mission is not oceanography. It was difficult in some cases to classify a ship as an oceanographic vessel, and it is realized that some ships included in this publication are controversial in this respect. The vessels included are those which spend a significant amount of time at oceanographic survey or research.

We realize, with regret, that all nations and ships are not represented in this publication. However, we believe that once this publication is received by the scientific communities of the maritime nations, each will want to have pertinent ship data and photographs of its oceanographic vessels included. For this reason this publication was placed in a looseleaf binder. As we receive new information, additional pages will be issued periodically, obsolete vessels may be deleted, and new vessels may be added. The completeness and accuracy of this publication depends almost entirely on the interest and cooperation of the various countries and institutions who are most familiar with their own vessels, and their continued assistance is requested to keep this publication up-to-date.

Because future additions or deletions will be made, a decimal system of pagination rather than consecutive numbers has been used. By this method, new ships may be added without changes to the Table of Contents.

For ease in locating individual vessels, an Index of Ship's Names is provided. Also because of the many abbreviations and symbols and the much used mariner's terminology, we have added special sections to define these items.

It is anticipated that the countries and ships neglected in our first printing and newly constructed vessels will be included in our periodic updatings. The following questionnaire is presented for those countries, institutions, and scientists who wish their ships to be included. All questions should be answered and a ship photograph, drawing, or plan sent, if available. Please forward this information to the National Oceanographic Data Center, Washington 25, D.C., U.S.A.

Name of Ship. In case there is any special meaning for the name please give pertinent background.

Institution, Organization, or Foundation. Name and address of the organization to which the ship belongs and by whom it is operated.

Type of Ship. Tell whether the ship was originally designed and built as a research ship or is an adapted corvette, sea-going tug, transport, etc. Indicate type of hull - steel or wood.

Date. Year of construction.

Length Overall. Preferably in feet.

Beam Extreme. Preferably in feet.

Drafts. Different drafts of the ship.

Displacement of Ship. Full load, light load, etc.

Tonnage. Gross and net.

Speed. Service speed, maximum speed, and minimum speed at which the ship can operate.

Range and Endurance. As the ship may be engaged in different scientific tasks which do not require it to travel long distances but to remain at sea (drifting, heaving to, etc.), it is very convenient to state the number of working days at sea and the limiting factor(s) for such range.

Crew and Scientists. Mention the space available for the crew and scientists. Be generous in the description of the facilities of the ship for her personnel, either crew or scientists.

Mention also if women scientists can be housed in the vessel. Indicate whether the ship has salt water showers (this allows frequent baths without depleting the fresh water supply).

Propulsion. Type - turbine, steam engine, diesel-electric, etc. Indicate if ship can also be driven by sails.

Propellers. Number and if controllable pitch type.

Power. Shaft horsepower in HP.

Fuel. Type and amount used in the different services. The planning of joint cruises on an international cooperative basis going to remote areas where not all types of fuel are available makes this information very important. If possible, please indicate the principal characteristics of the fuel.

Electrical Power Available.

- a. Kilowatts generated on the ship.
- b. Kilowatts required for normal operation of ship.
- c. Kilowatts available for scientific apparatus and instruments.

Characteristics of the Electrical Power.

Different voltages and frequencies available and kilowatts available at those voltages and frequencies. The complexity of the scientific instrumentation used today requires a great versatility in the electrical characteristics of the power supply plant of the ship. Please indicate also the direct current available by the use of batteries.

Navigational Instruments. Describe all the instruments available for determining the position at sea (gyrocompass, magnetic compass, ship log, different types of radar, sonar, radio direction finder, electronic systems [Decca, loran, etc.], inertial systems, etc.).

Communication Facilities. Types of transmitters and receivers, range of frequencies, etc.

Echosounders. State amount, type, range and time measuring device used on the echosounder. If possible, state the precision of the data on the basis of the time measuring device and resolution of the trace in the graph. Indicate also if other continuous variables are recorded on the same graph. Mention if the length of the ping can be changed.

Hydrographic Winches. Give ample information on the number of oceanographic winches (light winch for hydrographic station, heavy winches for dredging, coring and collection of large amounts of water, BT winches, etc.). Indicate the manufacturing company, the kind and amount of power used, amount of cable stored (diameter of the cable), velocity of lowering and recovering of the hydrographic wire and other convenient information. The location of the winches is an interesting datum to be included. Mention also other special winches.

Acoustical Characteristics. If possible mention the levels of the radiated noise and internal noise. Can the ship be put in a noiseless condition for special listening to the different noises from the environment? If so, for how many hours? This condition is also applicable to seismic work at sea. Be careful in this question because the noiseless condition implies a dead condition for the ship. Everything is stopped, even the motors of the air pump for fuel stoves in the galleys.

Laboratories. Different laboratories available in the ship, specific tasks performed in each of them, and different available kinds of energy (electrical, gas, compressed air, etc.). Please indicate if laboratories are air-conditioned and the approximate area of each. Include the meteorological facilities, surface and upper air instrumentation (radiosonde, meteorological rockets, ionospheric sounder, etc.).

Habitability. Explain if the ship is prepared to work in the tropics as well as at the poles.

Fresh Water. Amount that ship can hold. Daily consumption. Distillation capacity.



Special Features. Explain features such as the existence of a center well, bow propulsion, underwater visual observation station, ice strengthening, scientific freezer space, etc.

Antirolling Devices. Mention the existence of antirolling devices which increase the possibilities of operation of the ship in rougher seas (passive or active tanks, rolling keels, special stabilizers, etc.). Up to what Sea State can the ship perform the different oceanographic observations?

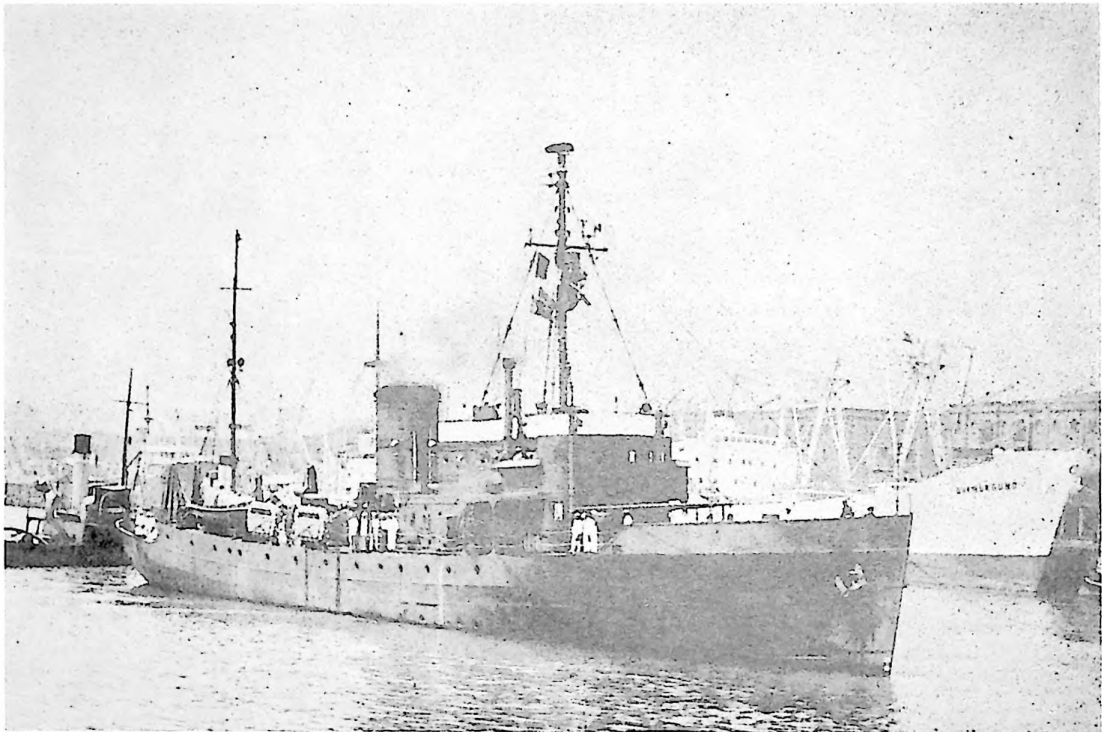
Type of Observations. On the basis of the information given above please summarize the type of oceanographic observations the ship is able to make (hydrographic cast, bottom sampling, coring, dredging, extraction of large volumes of water, underway observations [continuous magnetic recording, gravity, soundings, etc.], seismic work, etc.).

Remarks. Anything else you consider convenient to explain.

# **ARGENTINA**

## **SECTION 1**

## CAPITAN CANEPA



**TYPE:** Corvette built in Canada and totally refitted to perform oceanographic work; steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1940	62.7 m.	10.1 m.	4.7 m.	1,250 tons		800

### PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
10	15			15 days

### COMPLEMENT

CREW	SCIENTIFIC STAFF
96	5

## **AFFILIATION**

Navy Hydrographic Service.

## **PROPULSION**

Steam reciprocating engine, triple expansion, single fixed-blade screw, 2,500 HP. Uses Naval fuel oil; capacity 209 tons. Also carries 25 tons Gas oil and 5 tons of oil.

## **ELECTRICAL POWER**

Ship generates 150 KW, requires 30 KW for normal operations, 120 KW available for scientific work. Two dynamos of 75 KW each, 220V DC. Also two converters for 220V DC to 220V AC of 10 KW each.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Sperry gyrocompass and repeaters, two magnetic compasses, Decca radar, RDF (long wave), and "Sal Selsyn" log.

Communication - Radio-telegraph equipment, long and short wave. Radio-telephone for short wave and VHF.

Echosounders - Two echosounders "EDO" coupled to PDR (type MK V), range 6,000 fms., length of ping can be changed. Also has Sonar Contour Scanning Set AN/SQN-3 (XN-1) made by EDO Corp. that can be used as shallow sounder.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Two oceanographic winches that work on 220V DC, one amidships, other on starboard stern. Both manufactured by New England Trawler Equipment Co., 15 HP, with 10,000 m. of 5/32" stainless steel wire. Also two electric BT winches on both sides of stern, each with 2,000' of 3/32" stainless steel wire.

## **ACOUSTICAL CHARACTERISTICS**

Has not been determined.

## **LABORATORIES**

Five laboratories: Biological laboratory (13.3 sq. m.) with sinks, tables, and electric outlets. An ionospheric sounder located here.

Geophysical laboratory (13.3 sq. m.) with two echosounders, magnetometer AN/ASQ-3A and Decca Sonar whose drum can be moved horizontally and vertically and can be used as sounder. Meteorological station operates in this laboratory. Oceanographic laboratory (20.9 sq. m.) where bottom and water samples are analysed. Photographic laboratory (2.1 sq. m.) has enlarger and miscellaneous auxiliary devices. Chemical laboratory (20.9 sq. m.) for chemical determinations at sea. Bottled gas available. All laboratories ventilated and have electric supply.

#### **HABITABILITY**

Ship not prepared to work in tropical zones and requires modifications for polar zone work. Carries 98 tons of fresh water (62 for boilers, 36 for drinking); distillation capacity is 10 tons/day. No salt water showers; fresh water consumption must be restricted.

#### **OTHER FEATURES**

Has center well 2 x 2 m. No antirolling devices; ship can make Nansen casts up to Sea State 5.

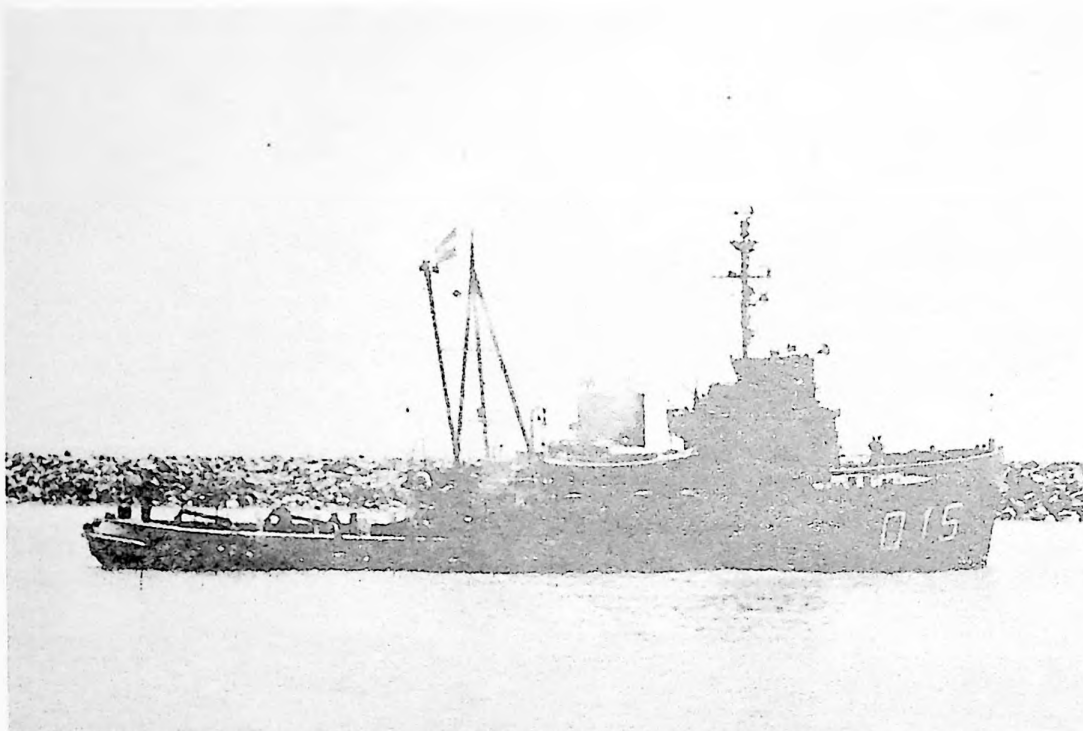
#### **TYPE OF OBSERVATIONS**

Nansen casts, bottom sampling, bottom photography, vertical and surface plankton hauls, BT, color and transparency, ionospheric soundings, continuous bottom profile, continuous magnetic registers, biological net tows, meteorological observations, and chemical analysis of sea water.

#### **REMARKS**

Ship modified and refitted for oceanographic work in 1956; named after the distinguished Captain of the Argentine Navy who promoted oceanographic activities in Argentina. Cost of ship operation about \$2000/day.

# CHIRIGUANO



**TYPE:** Sea going Tug (ex-U.S. ATA Class), steel hull. Above photo is CHIRIGUANO-and SANAVIRON-type.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1945	43.9 m.	10.3m.	3.7 m. (mean)	808 tons (full)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
7.8	13.6	4.7	16,700 miles	60 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
51 to 65 (total)	

## **AFFILIATION**

Argentine Navy.

## **PROPULSION**

Diesel electric, single fixed-blade screw, 1,500 HP. Uses diesel oil; capacity 195 tons.

## **ELECTRICAL POWER**

Ship generates 1,209.6 KW, requires 980 KW for normal ship operations. Available for scientific work: 105 KW, 120V DC, and 220 KW, 220V DC. Also has available 560V DC.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Sperry gyrocompass (MK 34) with six repeaters, two magnetic compasses, mechanical log (Trident), electric log (Santos Zagki), five echosounders, RDF (Dak-3), and radar (Raytheon Pathfinder, Mod. 1402).

Communication - Transmitters, receivers, and transceivers for LF, MF, HF, and VHF.

Echosounders - Kelvin-Hughes, Mod. MS21, type 13, range 250 fms., ping length variable. Kelvin-Hughes, Mod. MS26, type 3, range 120 fms., ping length variable. Kelvin-Hughes, Mod. MS26, type E, variable ping. Kelvin-Hughes, MS26, type A, range 540 ft., installed on motor boat, variable ping.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Electric windlass (Johnson), 12.5 HP, maximum load 2,600 kg., located on the bow; cannot work continuously for more than 30 minutes. Electric winch (Johnson) 20 HP, maximum load 5,420 kg., located on the stern; can work continuously up to 30 minutes. Cargo winch, 10 HP, load 1,300 kg. Manual winch, load 1,500 kg. Trawling device, 50 HP.

## **ACOUSTICAL CHARACTERISTICS**

Ship cannot be put in absolutely noiseless condition.

## **LABORATORIES**

Has hydrographic and photographic laboratory.

### **HABITABILITY**

Prepared to work in polar zones and in tropics. Carries 103 tons of fresh water; no distillation apparatus; salt water showers available.

### **OTHER FEATURES**

No antirolling devices. Can make oceanographic casts up to Sea State 3 or 4.

### **TYPE OF OBSERVATIONS**

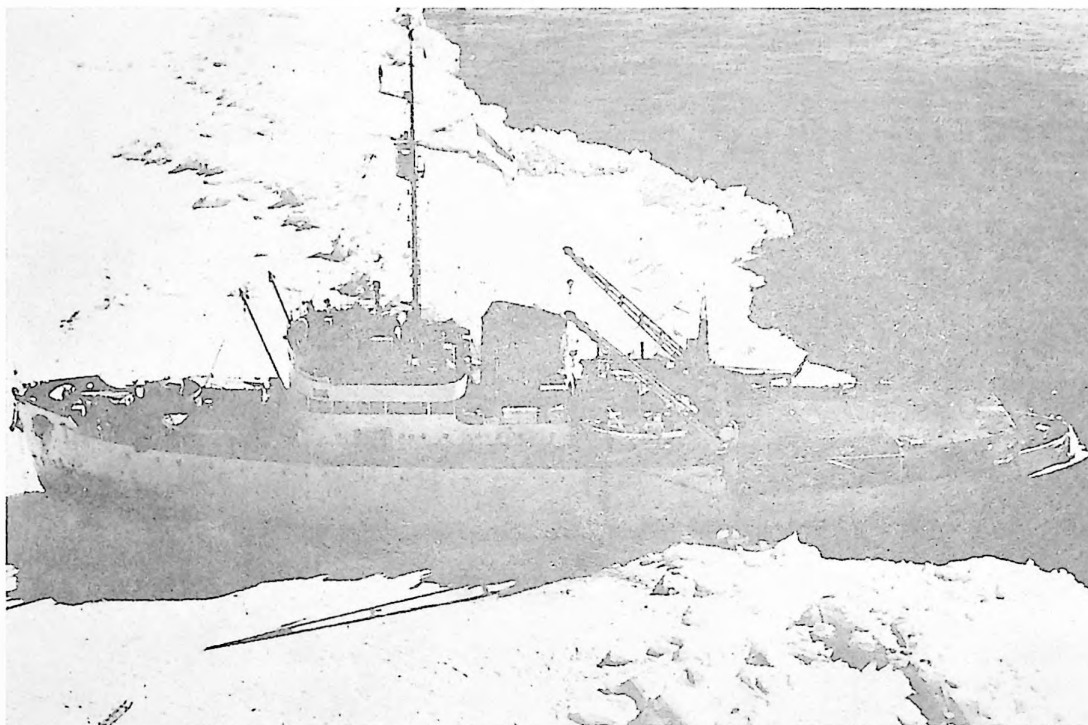
Water samples, bottom samples, BT's, continuous soundings, and meteorological and biological observations.

### **REMARKS**

Cost of operation \$1,900/day. Ship named after an old tribe of Argentine indians.



# GENERAL SAN MARTIN



**TYPE:** Icebreaker, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1954	84.7 m.	19.0 m.	6.9 m.	5,301.3 tons (full)	3,640.4	954.8

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
8.5	16.1	3.0		300 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
170	38

## **AFFILIATION**

Navy Department, Ministry of National Defense.

## **PROPULSION**

Diesel electric; twin screws, 7,060 HP. Uses diesel oil; carries 840 tons.

## **ELECTRICAL POWER**

Ship generates 830 KW, 600 KW required for normal ship operations, about 100 KW available for scientific work. Main current is 220V DC. Small converters for special equipment.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Two Mariner Pathfinder radar sets (Raytheon), one RDF (C. Plath E.M.B.H.), one gyrocompass (Anschutz E.M.B.H.), and one course recorder (Anschutz).

Communication - No information; presumed to have latest equipment.

Echosounders - Two shallow echosounders, Atlas Echograph, range 500 fms. Two deep echosounders, Atlas Echograph, range 4,000 fms. One double purpose echosounder, Kelvin-Hughes, range 5,000 fms.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Two electric oceanographic winches (A.E.G. type), placed on stern, one on each side, on platforms. Each has 5,000 m. of 5 mm. cable. One electric BT winch ("SIAM" type), located starboard aft, with 600 m. of 3 mm. cable. One electric trawling winch aft, with electromagnetic brake that releases loads over 40 tons automatically.

## **ACOUSTICAL CHARACTERISTICS**

Not possible to put ship in absolutely noiseless condition.

## **LABORATORIES**

Has oceanographic laboratory for chemical determinations and storage of biological and bottom samples. Also has photographic and meteorological laboratories. All laboratories have electrical energy.

## **HABITABILITY**

Can operate in polar zones; not prepared for tropical zones. Carries 156 tons of fresh water (72 for drinking, 83 for general services). Distillation capacity 10-15 tons/day. With restrictions, daily consumption 20-25 tons/day.

## **OTHER FEATURES**

Special strengthened steel hull for icebreaking. No antirolling devices. Has reconnaissance aircraft and helicopter on board.

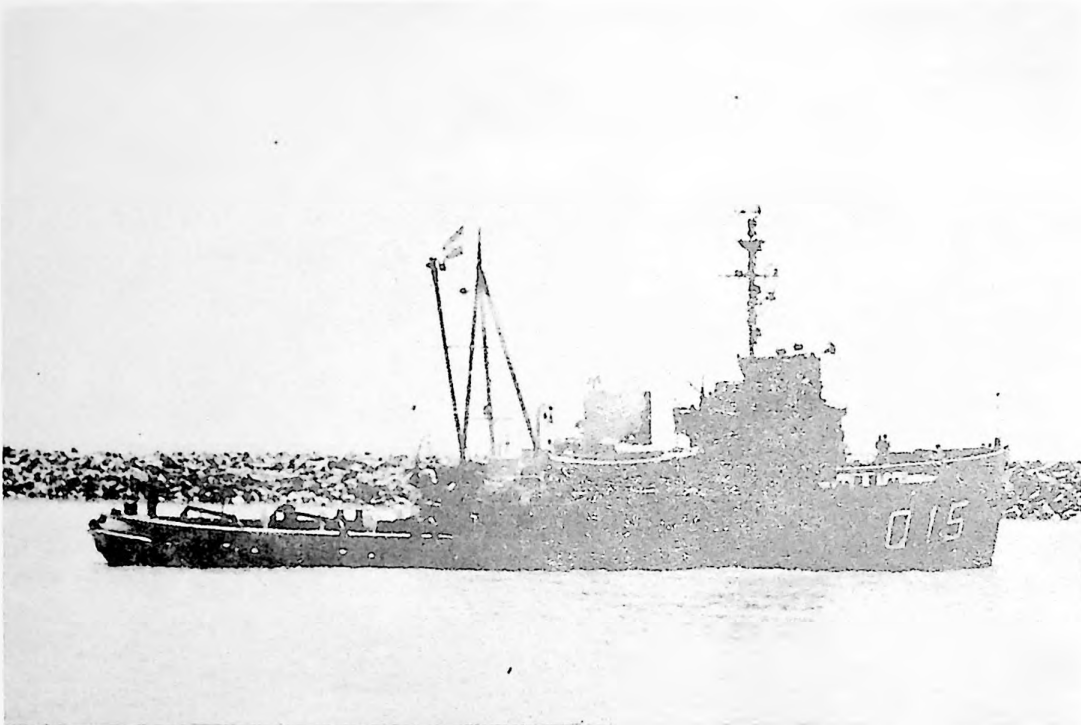
## **TYPE OF OBSERVATIONS**

Oceanographic stations up to 6,000 m., chemical, physical, and biological determinations.

## **REMARKS**

Primary mission of ship is not oceanographic work, but does oceanography while changing personnel at Argentine Antarctic bases. Cost of operating ship about \$1,900/day.

# SANAVIRON



**TYPE:** Sea going Tug (ex-U.S. ATA Class), adapted as hydrographic ship, steel hull. Above photo is CHIRIGUANO-and SANAVIRON-type.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1945	40.7 m.	10.3 m.	4.9 m	808 tons (full)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
7.5	11.5	4	16,700 miles	20 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
51	6

## **AFFILIATION**

Navy Department, Ministry of National Defense.

## **PROPULSION**

Diesel electric, single fixed-blade screw, 1,500 HP. Uses Gas oil (density 0.845); capacity 165 tons.

## **ELECTRICAL POWER**

Ship generates 120 KW, 22 KW required for normal ship operations, about 80 KW available for scientific work. Main current 110V DC, 120 KW. One converter for 220V AC, 50-cycle, 3 KW (1 KW for scientific purposes). Two converters for 110V AC, 50-cycle, 1.5 KW each (0.5 KW each for scientific purposes).

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass, radar, two magnetic compasses, and RDF.

Communication - Transmitters - One TBL-13, LF, MF, and HF; one KRT-1, MF and HF; one TR-2, MF and HF. Three receivers and transceivers SCR-522, VHF. One emergency transmitter TB. Visual communication.

Echounders - One mechanical sounder, Hazzauith-Heath. One Hughes echosounder MS21, range 720 ft. One Kelvin-Hughes echosounder, MS26A-MKII, range 540 ft.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

None.

## **ACOUSTICAL CHARACTERISTICS**

Possible to have absolute "quiet" condition for 1 or 2 hours.

## **LABORATORIES**

None.

## **HABITABILITY**

Can operate in polar zones. Can be modified to work in tropics. Carries 100 tons of fresh water; no distillation facilities.

# AUSTRALIA

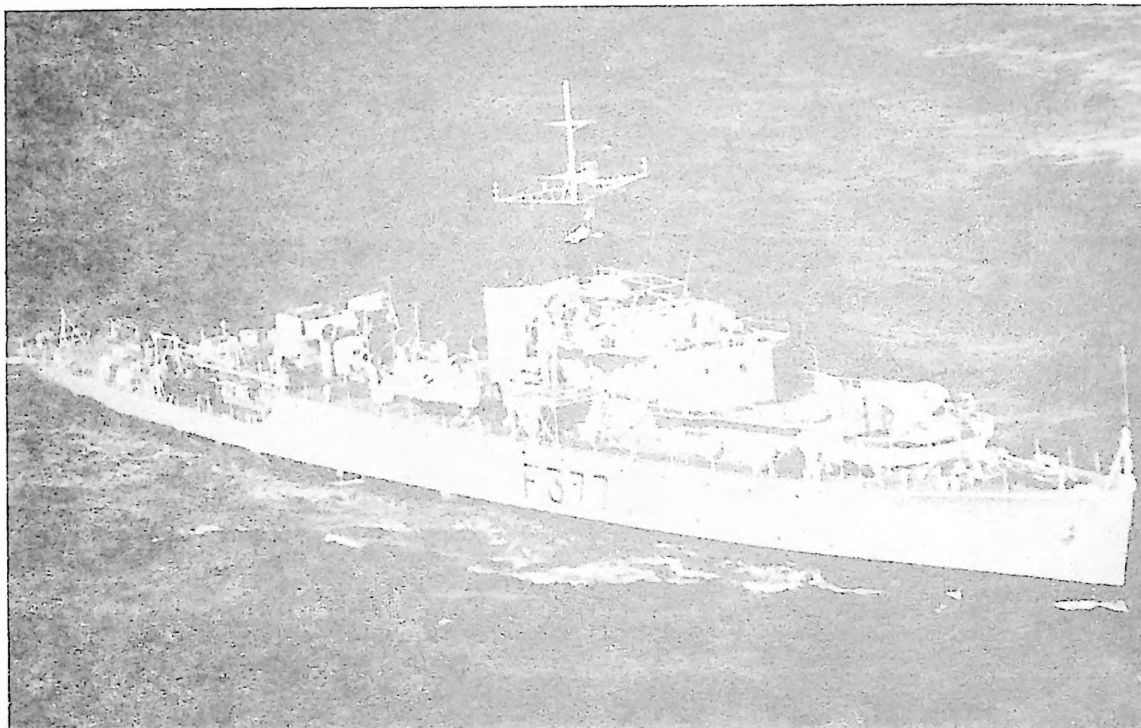
## SECTION 2

## DERWENT HUNTER

NO PHOTO AVAILABLE

This ship is a Fisheries Research Vessel (F.R.V.) for the Division of Fisheries and Oceanography, Commonwealth Scientific and Industrial Research Organization. She is 72' long and operates out of Sydney. She is an auxiliary schooner powered with 68 HP Gardner diesel. Has two Kelvin-Hughes echosounders (Type 24D and Type 24E). The deck winch is hydraulically operated. Total complement, seven.

# DIAMANTINA



**TYPE:** Steel hulled, Australian RIVER Class Frigate.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1945	300'	37'	14'	1,490 tons		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
13	15	2	3,800 miles	18 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
140	8



## **AFFILIATION**

Operated by Royal Australian Navy for the Commonwealth Scientific and Industrial Research Organization.

## **PROPULSION**

Triple expansion steam reciprocating engine, two shafts (no pitch control), 5,500 IHP. Fuel oil capacity 500 tons.

## **ELECTRICAL POWER**

Two hundred-thirty V AC, 10 KVA, 50-cycle and 230V DC from two 70 KW and one 60 KW generators. Also available, 240V AC. Extra generator can be switched in for station work.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass, Chernikeef log, direction finder, radar, and asdic.

Communication - UHF, MF, and W/T. Long range to cover most frequencies.

Echosounders - EDO AN/UQN-1B Model 185, and Admiralty type 185. Can record up to 6,000 fms., with about 2% accuracy.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Oceanographic winch (electric) with 10,000 m. of wire 7-stage (resistance type). Two BT winches, electric clutch brake (sounding machine type) with 600 m. of wire. Steam winch with 3,000 m. of 4 mm. wire for plankton hauls and 6,000 m. of 1/2" wire for coring.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Two laboratories for physics, hydrology, zooplankton, phytoplankton, productivity, and biochemistry. Air-conditioned, hot and cold fresh water, cold salt water, gas, air, and vacuum lines.

## **HABITABILITY**

Capable of operating in all ice-free waters. Has 50-ton fresh water capacity with distilling plant; no salt water showers.

### **OTHER FEATURES**

Can make observations up to Sea State 5 or 6.

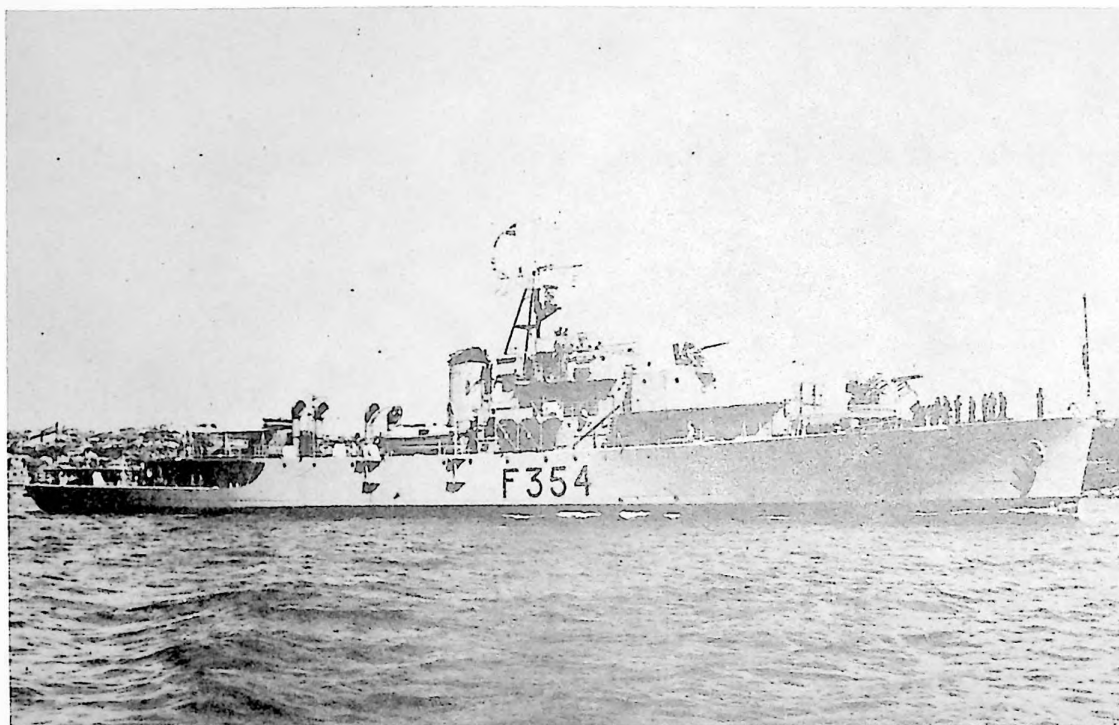
### **TYPE OF OBSERVATIONS**

Hydrological, physical, and some biological. BT, net tows, coring, dredging, and grab samples.

### **REMARKS**

Ship was recently refitted and new equipment may now be on board.

# GASCOYNE



**TYPE:** Steel hulled, Australian RIVER Class Frigate.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1943	301'8"	36'8"	15'	2,185 tons (full)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
12.5	18.5	2	5,661 miles	18 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
130	6

## **AFFILIATION**

Operated by Royal Australian Navy for Commonwealth Scientific and Industrial Research Organization.

## **PROPULSION**

Triple expansion, steam reciprocating engine, two shafts (no pitch control), 5,500 IHP. Fuel oil capacity 500 tons.

## **ELECTRICAL POWER**

Two hundred-thirty V AC, 10 KVA, 50-cycle, and 230V DC from two 70 KW and one 60 KW generators. Also available, 240V AC. Extra generator can be switched in for station work.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass, Chernikeef log, direction finder, radar, asdic, and loran.

Communication - UHF, MF, and W/T. Long range to cover most frequencies.

Echosounders - EDO AN/UQN-1B Model 185, and Admiralty type 185. Can record up to 6,000 fms., with about 2% accuracy.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Oceanographic winch (electric) with 10,000 m. of wire 7-stage (re-sistance type). Two BT winches, electric clutch brake (sounding machine type) with 600 m. of wire. Steam winch with 3,000 m. of 4 mm. wire for plankton hauls and 6,000 m. of 1/2" wire for coring.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Two laboratories for physics, hydrology, zooplankton, phytoplankton, productivity, and biochemistry. Air-conditioned, hot and cold fresh water, cold salt water, gas, air, and vacuum lines. Also has plotting room.

#### **HABITABILITY**

Capable of operating in all ice-free waters. Has 50-ton fresh water capacity with distilling plant; no salt water showers.

#### **OTHER FEATURES**

Can make observations up to Sea State 5 or 6.

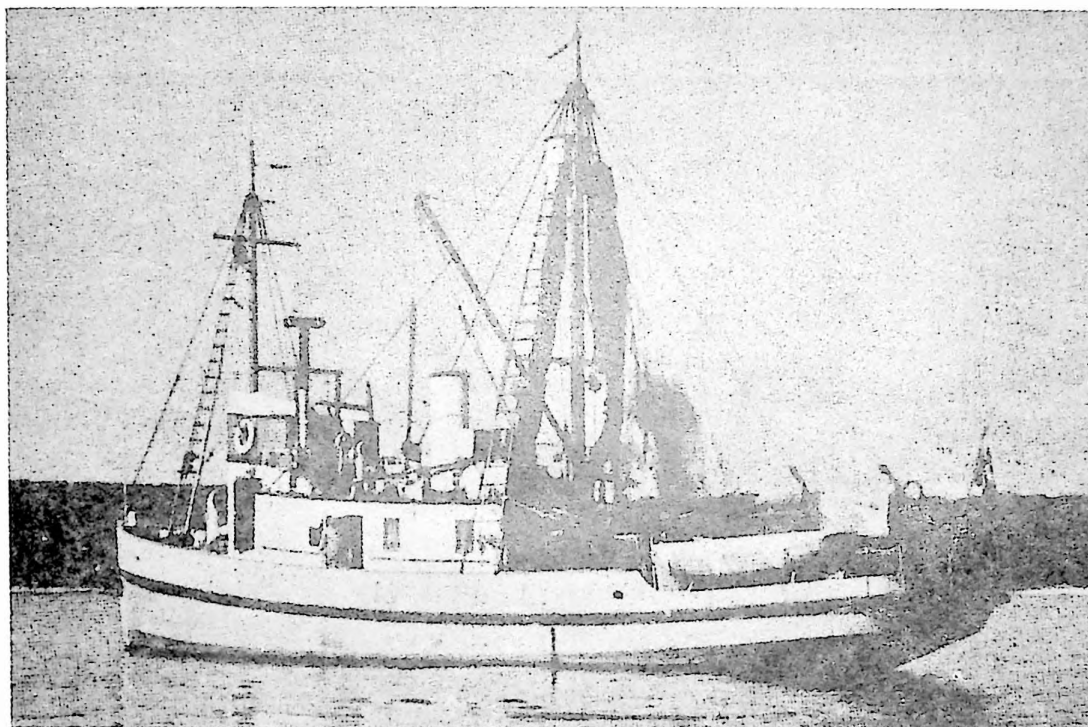
#### **TYPE OF OBSERVATIONS**

Hydrological, physical, some biological, BT, net tows, coring, dredging, and grab samples.

#### **REMARKS**

This ship was recently refitted and new equipment may now be on board.

# WARREEN



**TYPE:** A steel hulled, diesel-driven vessel built along the general lines of a Purse Seiner.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1938	82'	19'	8'4"	108.5 tons		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
9			3,000 miles	

## COMPLEMENT

CREW	SCIENTIFIC STAFF
12	2

## **AFFILIATION**

Research vessel of the Division of Fisheries and Oceanography, Commonwealth Scientific and Industrial Research Organization.

## **PROPULSION**

A single screw vessel, powered by a British Polar engine (diesel) of 215 BHP., turning at 450 r.p.m. Maximum fuel capacity 3,428 gal. diesel oil.

## **ELECTRICAL POWER**

No information.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

No information on navigation equipment or radio equipment. Has naval-type Hughes echosounder.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has electrically driven hydrological winch with 2,000 m. of 4 mm. wire driven by 3 HP motor. A standard type, horizontal sheared line-hauler powered by 1 HP electric motor through a 30 to 1 reduction gear and Danish seining winch.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Vessel has one laboratory with accommodations for two scientists.

## **HABITABILITY**

Used primarily in nearshore operations. Maximum fresh water capacity 12-1/2 tons.

## **OTHER FEATURES**

Equipped with whale marking gun.

### **TYPE OF OBSERVATIONS**

Used primarily for fisheries investigations, but has made considerable physical and chemical observations.

### **REMARKS**

None.



# DERWENT HUNTER

NO PHOTO AVAILABLE

TYPE: F.R.V. Converted, Fishing Vessel, wooden hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1946	72'6"	18'10"	9'		80	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
	7	1		18 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
6	3

## **AFFILIATION**

Commonwealth Scientific and Industrial Research Organization (C.S.I.R.O.),  
Division of Fisheries and Oceanography, Cronulla.

## **PROPULSION**

Gardner diesel and sails, 72 HP with single fixed blade propeller.  
Carries 600 gal. of diesel fuel.

## **ELECTRICAL POWER**

Has 110V DC and 240V AC.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Magnetic compass and ship log.

Communication - R/T transceiver.

Echosounders - Two Kelvin-Hughes (Type 24D and Type 24E), ranges  
0-720 fm. and 0-80 fm.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Two drum hydraulic, 8 HP, 3,000 m. wire on each drum.

## **ACOUSTICAL CHARACTERISTICS**

Daylight silence.

## **LABORATORIES**

Has 48 sq. ft. available space.

## **HABITABILITY**

Vessel can operate in tropics and temperate zones. Carries 500 gal.  
fresh water.

### OTHER FEATURES

Refrigeration for sample storage.

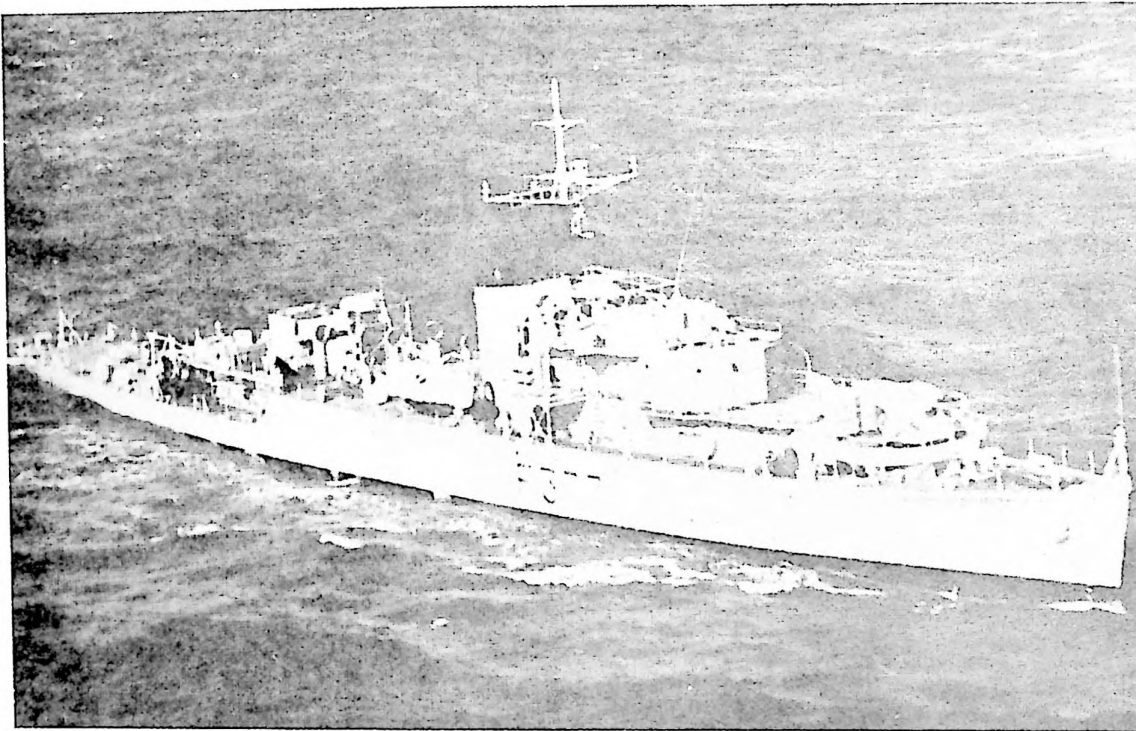
### TYPE OF OBSERVATIONS

BT, hydrology, bottom sampling, dredging, and underway observations.  
(G.E.K. temperature).

### REMARKS

Two masted bald headed schooner, 1,500 sq. ft. canvas in four sails.  
Converted for research in 1950/51.

# DIAMANTINA



**TYPE:** Steel hulled, Australian RIVER Class Frigate.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1945	300'	37'	14'	1,490 tons		

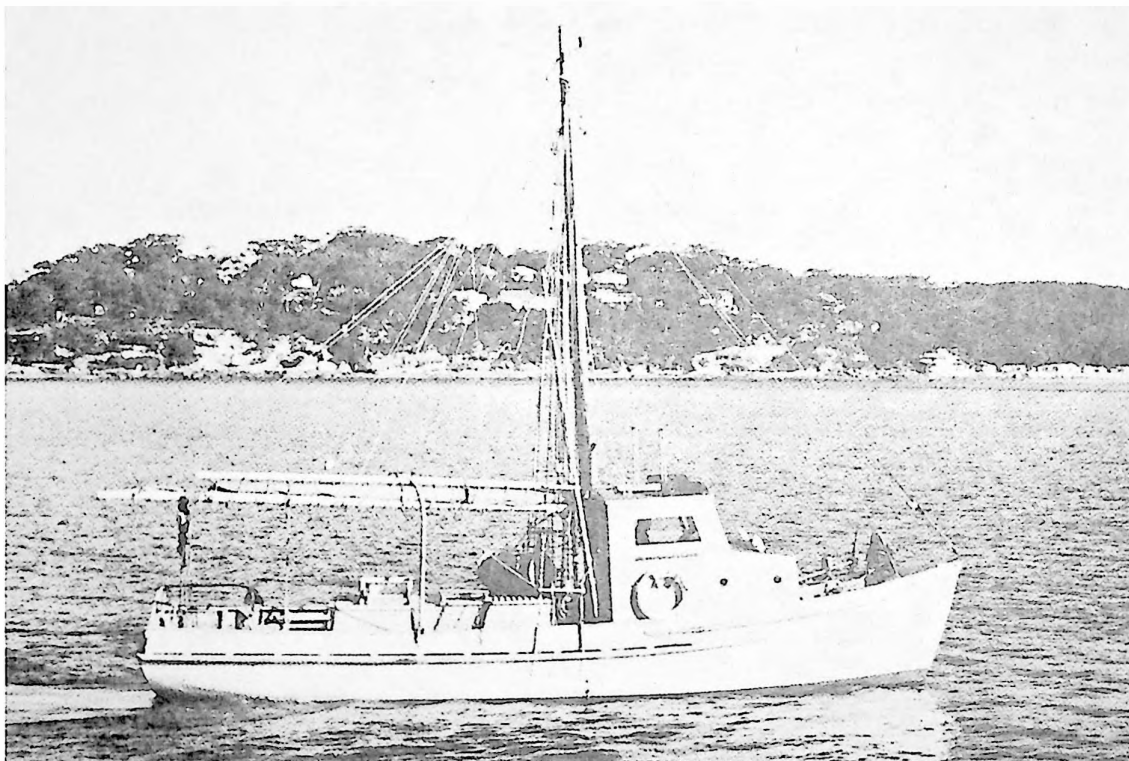
## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
13	15	2	3,800 miles	18 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
140	8

# MARELDA



**TYPE:** F.R.V. Converted wooden fishing vessel.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1946	36'	12'	5' 3" (aft)			

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
	7	1		7 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
2	1

## **AFFILIATION**

Commonwealth Scientific and Industrial Research Organization  
(C.S.I.R.O.) Division of Fisheries and Oceanography. Based at  
Eden.

## **PROPULSION**

Main Gardner diesel engine, 48 HP with auxiliary Conventry Victor  
diesel engine of 5 HP and auxiliary mainsail and staysail, single  
screw. Carries 100 gal. diesel.

## **ELECTRICAL POWER**

Has 12V and 24V DC and 240V AC.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Magnetic compass.

Communication - Radio transceiver with four transmitting frequencies.

Echosounders - Kelvin Hughes Fisherman's asdic.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Two drum hydraulic, 4 HP, 1,000 m. cable on each.

## **ACOUSTICAL CHARACTERISTICS**

Daylight silence.

## **LABORATORIES**

None

## **HABITABILITY**

Minimum facilities on vessel, no showers. Can operate in tropics  
and temperate zones. Fresh water capacity 44 gal.

#### OTHER FEATURES

None

#### TYPE OF OBSERVATIONS

Hydrology, bottom sampling, underway observation, (G.E.K., temperature). Environmental studies on seasonal tuna occurrences.

#### REMARKS

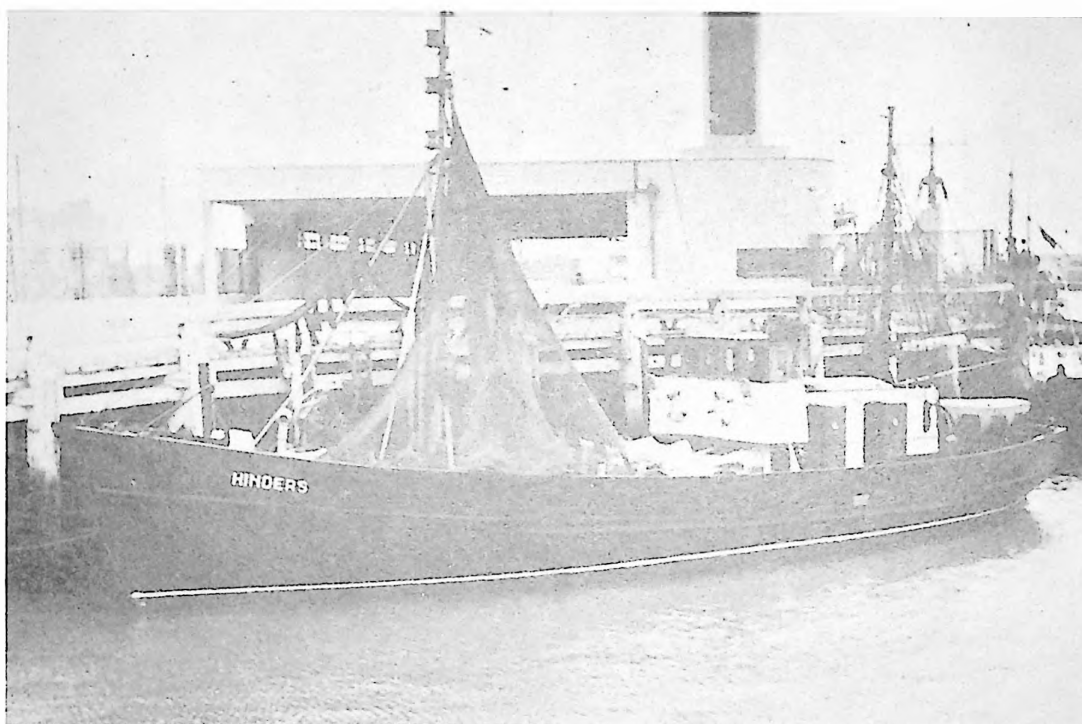
Cutter rigged vessel converted for research in 1955.

# **BELGIUM**

## **SECTION 3**



## HINDERS



**TYPE:** Originally built as an Escort Vessel, later adapted as Fisheries Research Vessel. Wooden hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1944	21.5 m.	6.4 m	2.5 m.		72	17

### PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
8	9.5	3		8 days

### COMPLEMENT

CREW	SCIENTIFIC STAFF
5-7	3-5

## **AFFILIATION**

Operated by Pilot Service, Ostend. Leased to The Ministry of Agriculture and Fisheries.

## **PROPULSION**

Diesel engine, single fixed-blade screw; 250 HP. Uses Gas oil; tank capacity 4 tons. Mizzen sail available for use.

## **ELECTRICAL POWER**

Ship generates 3.6 KW; 2 KW required for normal operations. Has available 250 amp.-hrs. for lighting and 160 amp.-hrs. for echosounder, Decca, and radio-telephone. Has 110V current and 24V from batteries.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Magnetic compass and Decca navigator.

Communication - Radio-telephone with three wave-lengths (pilot-service at Ostend, Ostend radio, and Fisherman's wave length); range 20 miles.

Echosounders - Atlas Fishfinder (0-100 m., 100-300 m. and 300-500 m.), 75 echos/40 sec.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

None.

## **ACOUSTICAL CHARACTERISTICS**

Cannot be put in noiseless condition.

## **LABORATORIES**

One laboratory (2 x 3 m.) with electricity. Used for fish measuring and chemical analyses.

## **HABITABILITY**

Limited to local nearshore work. Carries 1,500 liters fresh water; no distillation capacity.

## **OTHER FEATURES**

None.

### **TYPE OF OBSERVATIONS**

Primarily fisheries research, but also hydrographical observations, dredging, and bottom sampling.

### **REMARKS**

Performs experimental comparative fishing with trawls of different widths of cod-end meshes made of natural and synthetic twines. Fish tagging experiments (especially soles).

# WEST HINDER

NO PHOTO AVAILABLE

**TYPE:** Built as Lightvessel, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1950	43.5 m.	7.8 m	3.0 m.		419	40

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
8				ship is anchored

## COMPLEMENT

CREW	SCIENTIFIC STAFF
9	2

## **AFFILIATION**

Owned by Ministry of Communications, Department of the Marine at Brussels. Operated by Pilot-Service, Ostend.

## **PROPULSION**

Is generally at anchor. Has diesel-electric drive, single-screw, fixed-blades, 230 HP. Uses Gas oil; 20 tons tank capacity.

## **ELECTRICAL POWER**

Ship generates 64.5 KW and requires 15 KW for normal operation. Uses 24V and 110V for lighting ship and beacon. These currents can also be used for scientific work.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Two magnetic compasses.

Communication - Radio-telephone, 5 wave lengths(1708, 2182, 2484, 2376, and 2256 KC); range 120 miles.

Echosounder - None.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

None.

## **ACOUSTICAL CHARACTERISTICS**

Ship can be put in noiseless condition for about 8 hours.

## **LABORATORIES**

None.

## **HABITABILITY**

Quarters comfortable. Carries 20 tons of fresh water; no distillation capacity.

## **OTHER FEATURES**

None.

## TYPE OF OBSERVATIONS

Meteorological observations mainly; wind (direction and force), air temperature (dry and wet bulb), sea surface temperature, cloud cover, and current measurements.

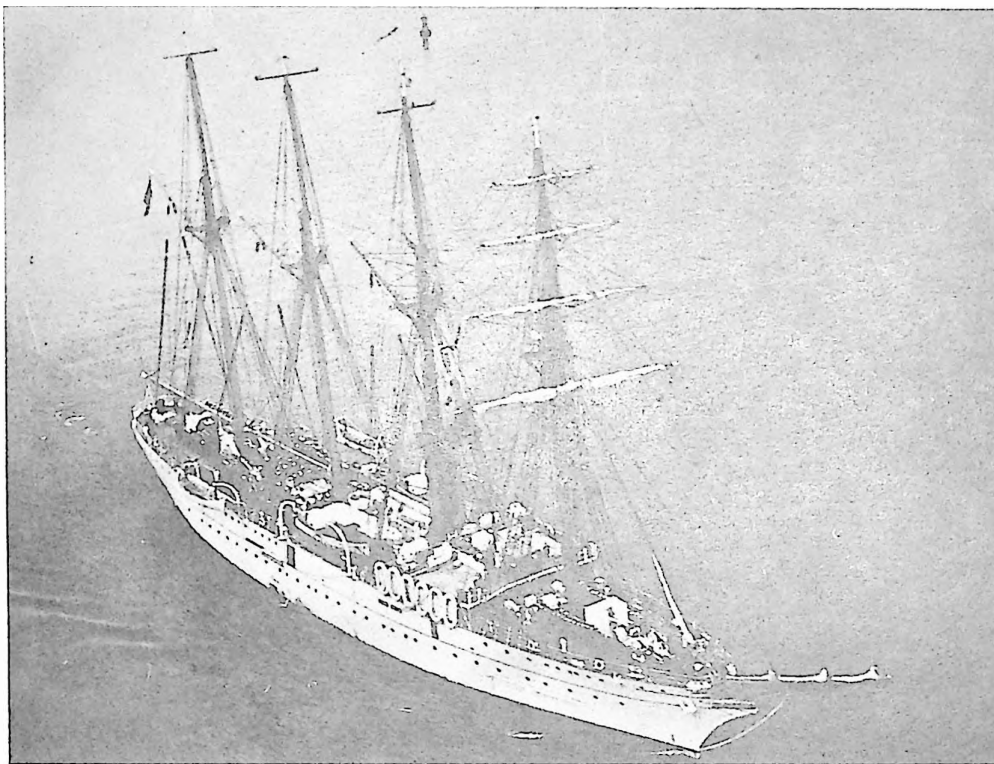
## REMARKS

Lightvessel belongs to the State; weather instruments to the Air Department. Named after SW-end of Westhinder Bank. Position of ship 51° 22'30"N. 2° 26'20" E.

# **BRAZIL**

## **SECTION 4**

## ALMIRANTE SALDANHA



**TYPE:** Four-masted Clipper, originally built as a Naval Training Ship.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1934	93.6 m.	15.9 m.	5.9 m.	3,825 tons (full)		

### PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
11	12		12,000 miles	

### COMPLEMENT

CREW	SCIENTIFIC STAFF
456 (Total)	



## **AFFILIATION**

Brazilian Navy.

## **PROPULSION**

Diesel motor, 1,500 HP. Sails available (25,990 sq. ft.).

## **ELECTRICAL POWER**

Electrical power supplied by three diesel generators of 250 HP each.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Two radar sets (Raytheon Mariner Pathfinder and Raytheon Mod. 1404), loran (Sperry MK-2 Mod. 2), and gyrocompass (Sperry MK XIV).

Communication - No information:

Echosounders - Has three types: SQN-1, (range 1,000 m.), EDO (range 6,000 m.) and "Electric Sounding Machine" TS-3 (Japanese) with 5,000 m. of cable.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

No information.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Has one laboratory for chemical analysis.

## **HABITABILITY**

No information, presumably capable of operations in all ice-free waters.

## **OTHER FEATURES**

No information.

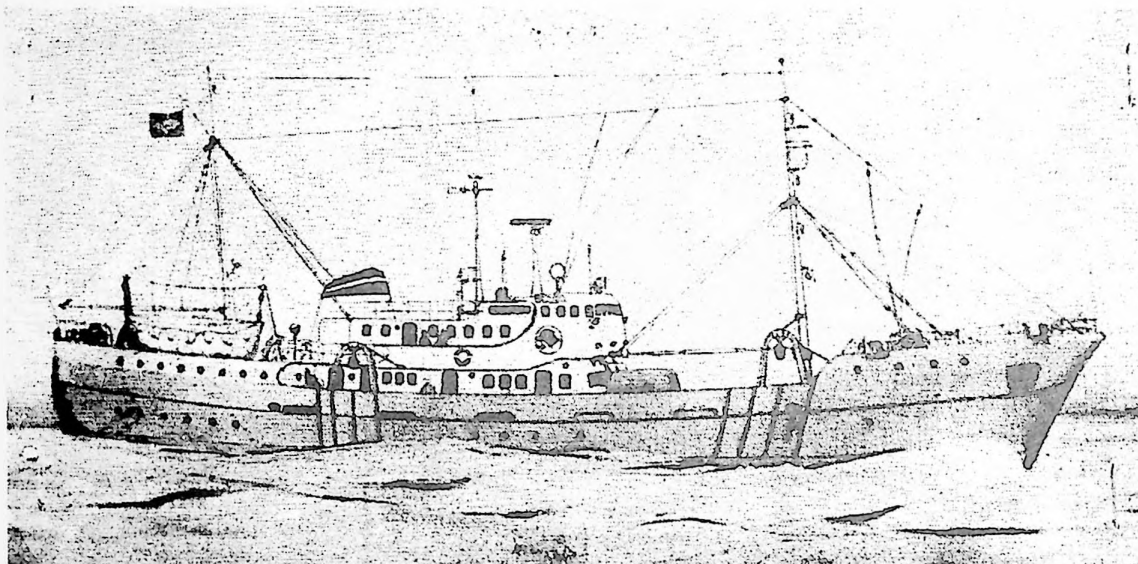
**TYPE OF OBSERVATIONS**

No information.

**REMARKS**

None.

# OCEANOGRAPHIC VESSEL UNNAMED



**TYPE:** Built as Oceanographic Vessel, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1962				700 tons		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
				20 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
16	10-Scientific 10-Students

**AFFILIATION**

Oceanographic Institute, State of Sao Paulo, Brazil.

**PROPULSION**

No information.

**ELECTRICAL POWER**

No information.

**NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

No information, but presumed to be well equipped as ship was built especially for oceanographic and scientific research.

**HYDROGRAPHIC WINCHES AND EQUIPMENT**

No information.

**ACOUSTICAL CHARACTERISTICS**

No information.

**LABORATORIES**

Six laboratories which are specifically designed for studies in: fishing, biology, special chemistry and bacteriology, general biology, chemistry and technology, study of sea material and photography.

**HABITABILITY**

No information.

**OTHER FEATURES**

Has a specialized library. Refrigerated chamber with a capacity for 50 tons of fish, (the fish not used for scientific purposes are sold to help ship maintain itself with the money received).

**TYPE OF OBSERVATIONS**

Oceanographic and fisheries research.

**REMARKS**

Besides serving as floating laboratory, this ship is used for experimental fishing and training of fishing masters. Vessel built and purchased from Norway.

# **CANADA**

## **SECTION 7**

## A. T. CAMERON

NO PHOTO AVAILABLE

TYPE: Trawler.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1958	177'	32'				

### PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
			7,500 miles	

### COMPLEMENT

CREW	SCIENTIFIC STAFF
25	9

## **AFFILIATION**

Research vessel of Fisheries Research Board of Canada.

## **PROPULSION**

Diesel powered.

## **ELECTRICAL POWER**

No information; presumed adequate for most survey situations.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Latest radar, depth sounding and other electronic devices. Two radar sets provided for long, intermediate, and short-range detection, enabling one set to be used in survey operations and other set for safe navigation.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

No information.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Five laboratories, each fitted out with modern equipment and gear for various research procedures as well as oceanographic and hydrographic survey work.

## **HABITABILITY**

No information; presumed capable of extended voyages in all navigable waters.

## **OTHER FEATURES**

Hull strengthened for ice navigation. Has 1,800 cu. ft. fish hold.

## **TYPE OF OBSERVATIONS**

Primarily used for fisheries research but also conducts oceanographic and hydrographic surveys.

## **REMARKS**

None.

## BEACON HILL



**TYPE:** Naval Frigate (FFE 303), PRESTONIAN Class, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1944	286'5"	36'7"	16'9" (aft)	2,250 long tons	1,938	1,077

### PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
12	17		9,600 miles at 12 kts.	40 days

### COMPLEMENT

CREW	SCIENTIFIC STAFF
140	6



## **AFFILIATION**

Royal Canadian Navy.

## **PROPULSION**

Four-cylinder triple expansion reciprocal, two fixed-blade propellers, 5,500 HP. Carries about 4,420 barrels of Bunker "C."

## **ELECTRICAL POWER**

Two generators provide 100 KW at 220V DC and two provide 120 KW at 220V DC. Normal ship operation requires 88 KW. Available for scientific work, 115V, 60-cycle, 5 KW.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Radar (Sperry and S.U.), Sperry loran, gyrocompass, Chernikeyf log, and sonar (147F, 164, and 501).

Communication - PV 500 transmitter (HF and LF), three CM11 transmitters, five 5CSR5A receivers, four TED-3 UHF transmitters, four AN/URT 7 UHF receivers, and one TDQ transmitter and receiver.

Echosounders - UQC-Admiralty and EDO UQN-1 with PDR.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Gasoline powered deep casting winches can be installed as required. Generally uses 20,000' of 5/32" wire.

## **ACOUSTICAL CHARACTERISTICS**

Ship cannot be placed in quiet state.

## **LABORATORIES**

Has 200 sq. ft. laboratory with water taps and electrical outlets.

## **HABITABILITY**

Ship can work in tropics or Arctic. Carries 88 tons of fresh water; distillation capacity 40 tons/day.

**OTHER FEATURES**

Bilge keels.

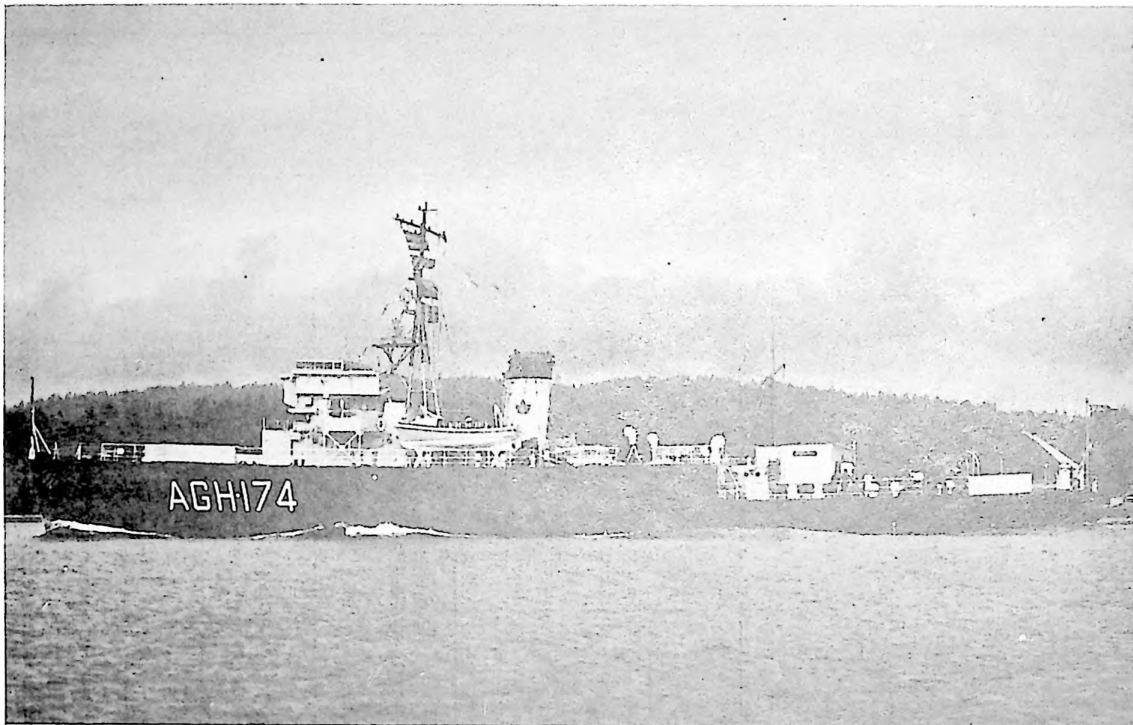
**TYPE OF OBSERVATIONS**

Light mid-water trawls, hydrographic casts, and BT observations.

**REMARKS**

During normal naval training cruises, the ship takes BT observations.

# OSHAWA



**TYPE:** AGH-174, ALGERINE Class Minesweeper, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1944	225'	35.5'	10' (mean)	1,263 tons	463	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
10	14		3,500 miles	30 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
43	8

## **AFFILIATION**

Operated by the Royal Canadian Navy as a Canadian Naval Auxiliary Vessel (C.N.A.V.) for Pacific Naval Laboratory and Pacific Oceanographic Group.

## **PROPULSION**

Main engine is steam reciprocating, triple expansion, two fixed-blade propellers, 2,600 HP. Uses Bunker"C."

## **ELECTRICAL POWER**

Ship generates 50 KW, 220V DC. Requirement for normal ship operation, 30 KW, 220V DC. Available for scientific work, 18 KVA, 115V AC. Constant frequency current and steady AC voltages available.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Loran (Type DAS-3 Fada Radio and Electric Co.), radar (Sperry MK 2 Model 0-1), gyrocompass, Chernikeef log, and radio direction finder.

Communication - Transmitters - Type PV-500 HM-2 CW; Type Marconi CN86; Type Marconi CM11 CW and voice. Frequency range, 375 KC to 28 MC. Receivers - Type Marconi CSR-5-A; Type Marconi CN86; Type MSL-5. Frequency range 15 KC to 30 MC. Crystal frequencies: 2118, 2716, 2844, 2182, 6267, and 4178 KC.

Echosounders - Bludworth, EDO UQN-1 and PDR.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One electro-hydraulic hydrographic winch with 30,000' of 5/32" wire. Two Kelvin BT winches each with 2,000' of 3/32" wire. One steam driven coring winch with 3,000' of 1" cable. Various gasoline powered winches may be placed on board as required for special purposes.

## **ACOUSTICAL CHARACTERISTICS**

Ship cannot be made quiet.

## **LABORATORIES**

Two laboratories, one dry with 200 sq. ft. of space the other wet with 50 sq. ft., both located aft. Working space on quarterdeck.

## **HABITABILITY**

Ship capable of working in Arctic or tropics.

## **OTHER FEATURES**

Has deep freeze facilities. Bilge keels.

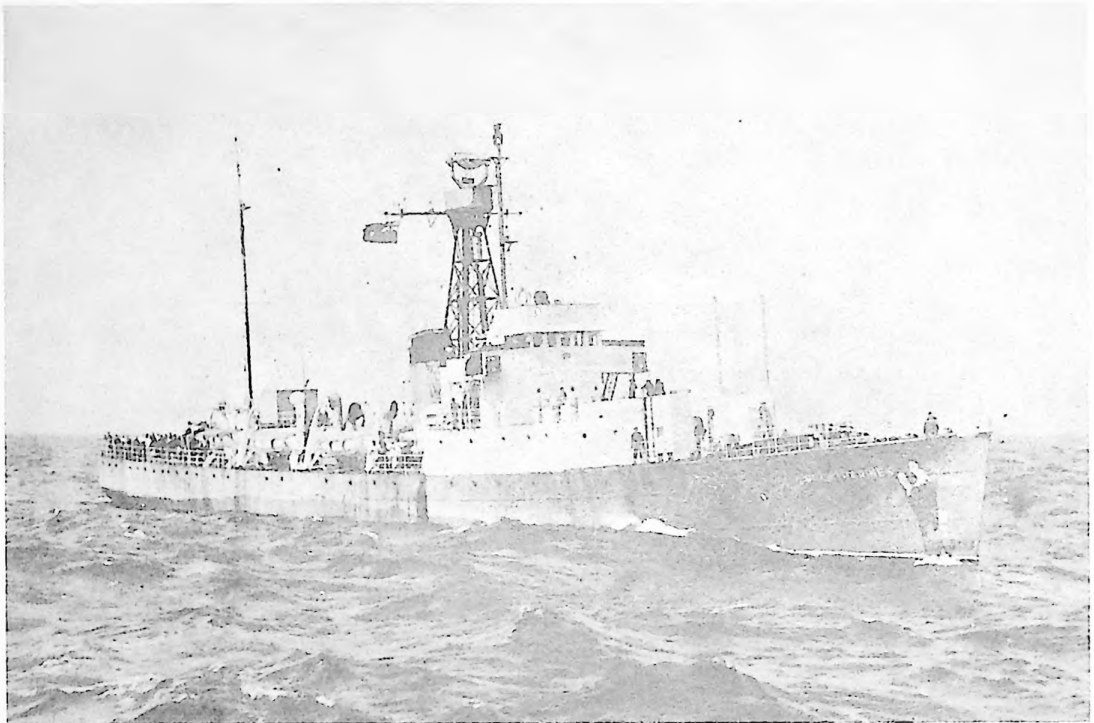
## **TYPE OF OBSERVATIONS**

Hydrographic casts, bathymetry, bottom sampling, coring, dredging, seismic work, acoustic surveys, plankton hauls, magnetic recording, and turbulence research.

## **REMARKS**

Women scientists could be accommodated with some rearrangement of space.

## ST. CATHARINES



**TYPE:** Ex-Royal Canadian Navy Frigate, steel hull, adapted for ocean weather station service (C.M.S).

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1943	286'5"	36'7"	14'2" (full)	1,368.5 tons (light)	1,895	

### PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
12	19	3	7,900 miles	7 weeks

### COMPLEMENT

CREW	SCIENTIFIC STAFF
43	2

## **AFFILIATION**

Operated by The Ministry of Transport, Ottawa, Canada.

## **PROPULSION**

Steam reciprocating, triple expansion engines, with two fixed-blade propellers, 5,500 IHP. Carries 930 tons of Bunker "A" fuel oil.

## **ELECTRICAL POWER**

Ship generates 120 KW. Required for normal ship operation, 55 KW. Available current, 110V, 9 KVA and 220V, 60 KW. Battery for emergency only.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Loran, gyrocompass, magnetic compass, patent log (Walker Trident), radar (277W, Decca 45, Decca 159), and direction finder.

Communication - Frequencies as specified for Ocean Weather Ship operations including UHF, CW equipment, and VHF radio-telephone, with voice transmissions.

Echosounders - Hughes echosounder (Type MS21, 120 ft. or 120 fms., 720 ft. or 720 fms. Domes not fit for soundings below 300 fms.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Medium duty hydraulic winch with 20,000' of 5/32" wire. Kelvin Automajor BT winch with 2,000' of 3/32" wire.

## **ACOUSTICAL CHARACTERISTICS**

Ship cannot be put in noiseless condition.

## **LABORATORIES**

Has laboratory (8' x 15') with electrical outlets, fresh water tap and sink. Meteorological office on ship from which radiosonde measurements are made.

## **HABITABILITY**

Comfortable quarters for middle latitudes. Carries 60 tons of fresh water; has distillation apparatus. No salt water showers.

### OTHER FEATURES

Bilge keels. Oceanographic casts to 1,200 m. have been made during 30 kt. winds, and 20 ft. swells. Has 15 cu. ft. deep freeze.

### TYPE OF OBSERVATIONS

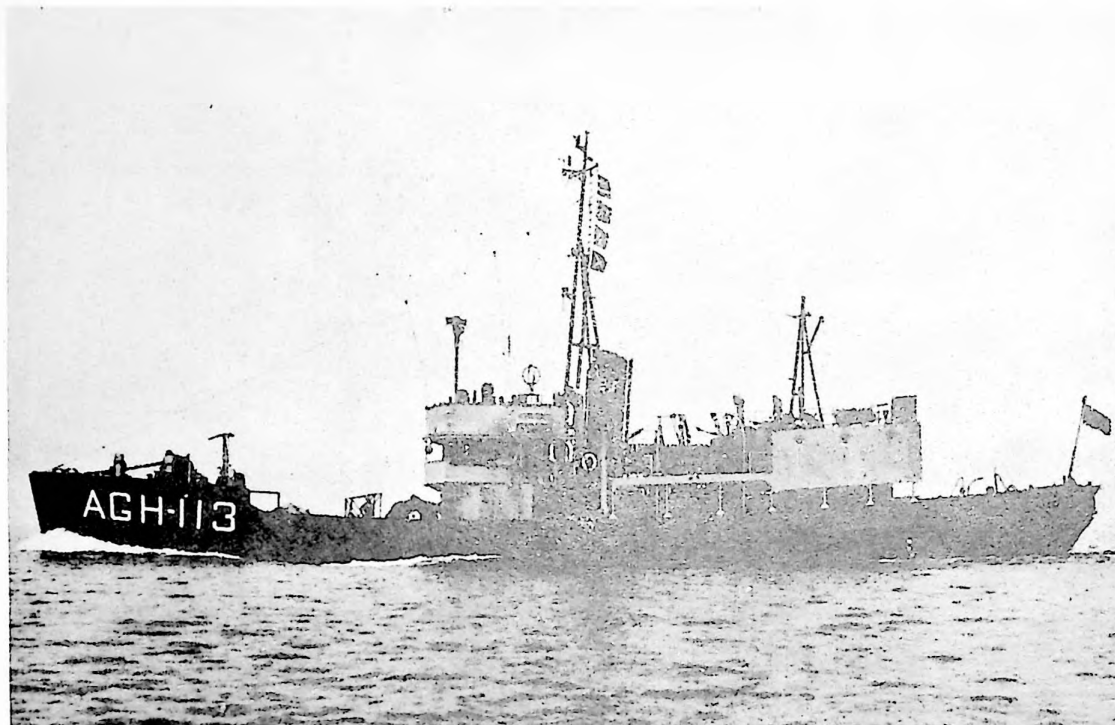
Makes oceanographic casts to 4,000 m., does horizontal and vertical plankton hauls, and BT observations to 900 ft. (stopped or underway at 5 kts.). No winches for dredging or coring.

### REMARKS

This ship mans Ocean Weather Station "P" (lat. 50°N., long. 145°W.), alternating with STONETOWN every six weeks. Oceanography secondary to normal duties of meteorology, search and rescue, navigational aid to ocean traffic (directional finder, radar, and beacon), communications, and bird and marine mammal population studies.



# WHITETHROAT



**TYPE:** AGH-113, Trawler hull, Minesweeper, steel.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1943	164'	27.5'	10.5'	580 tons		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
10	12.5		4,000 miles	18 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
26	8

## **AFFILIATION**

Operated by Royal Canadian Navy as Naval Auxiliary Vessel (C.N.A.V.) for Pacific Naval Laboratory and Pacific Oceanographic Group.

## **PROPULSION**

Main engine steam reciprocating, triple expansion, single fixed-blade propeller, 850 HP. Uses Bunker "C."

## **ELECTRICAL POWER**

Ship generates 27.5 KW, 110V DC. Normal ship operation requires 15 KW. Available for scientific work, 15 KVA, 115V AC.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Loran receiver and indicator (Model DAS-1, Fada Radio and Electric Co.), radar (type LN-27, Canadian Marconi Marine Radar), direction finder (type MDF5 Marconi Receiver), gyrocompass, and Chernikeef log.

Communication - Transmitters - Type 110-981A 100W CW Type Marconi CM11A, 30W voice and Type Marconi CN86. Frequency range is 360 KC to 14 MC. Receivers Type Marconi CSR5 and Type Marconi CN86. Frequency range is 80 KC to 30 MC.

Echosounder - Admiralty pattern A970B depth recorder. EDO UQN-1 with PDR.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One hydraulic hydrographic winch (two drums) with 20,000' of 5/32" wire. Two Kelvin BT winches each with 2,000' of 3/32" wire. One steam driven coring winch with 1,000' of 1/2" wire. Specialized oceanographic winches placed aboard as required.

## **ACOUSTICAL CHARACTERISTICS**

Ship cannot be made quiet.

## **LABORATORIES**

One 200 sq. ft. laboratory.

### **HABITABILITY**

Ship can work in Arctic or tropics.

### **OTHER FEATURES**

Has deep freeze facilities.

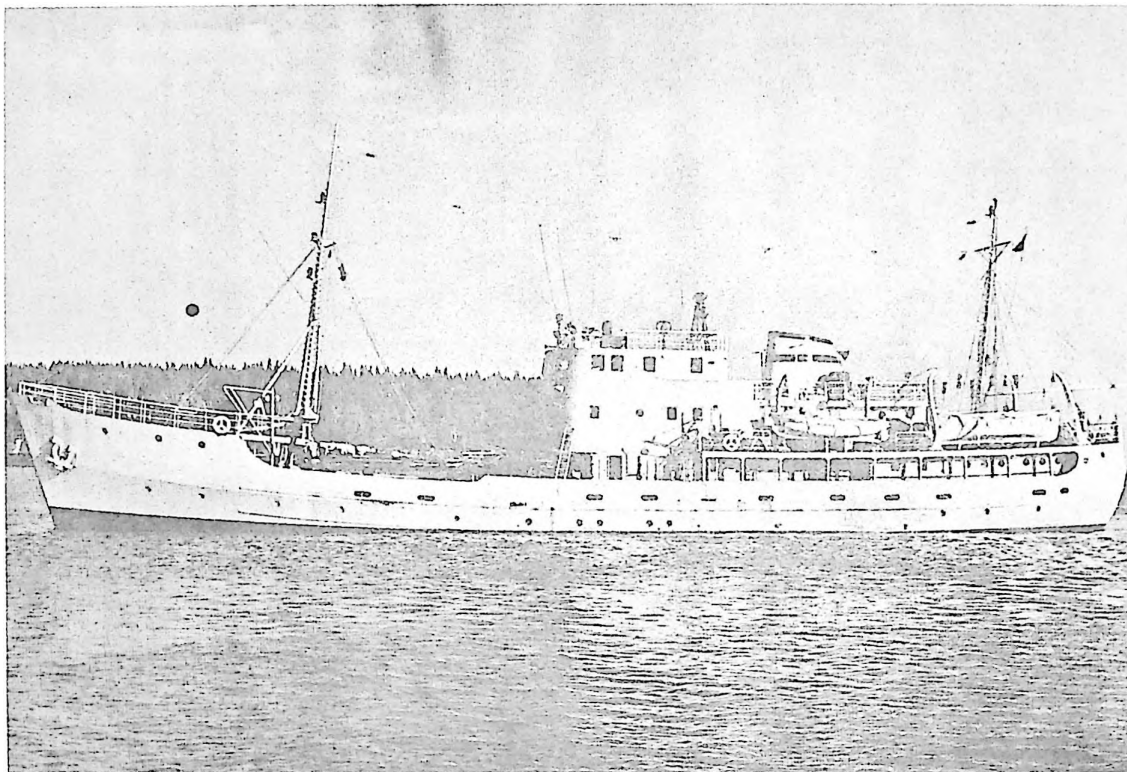
### **TYPE OF OBSERVATIONS**

Hydrographic casts, bathymetry, bottom sampling, plankton sampling, magnetic recording, seismic surveys, and turbulence research.

### **REMARKS**

None.

## A. T. CAMERON



TYPE: CMS, Trawler, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1958	177'	32'	12'7"		753.2	

### PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
	12		7,500 miles	42-56 days

### COMPLEMENT

CREW	SCIENTIFIC STAFF
25	9

## **AFFILIATION**

Fisheries Research Board of Canada, Atlantic Oceanographic Group.

## **PROPULSION**

Burmeister & Wain 8 cylinder, direct reversible. Single variable pitch propeller, 1000 BHP.

## **ELECTRICAL POWER**

Has 110V AC and 220V DC.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Decca marine navigator, automatic pilot, and two radar sets for long, intermediate and short-range detection, enabling one set to be used in survey operations and the other for safe navigation.

Communication - Latest equipment.

Echosounding - Three echosounders.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has four winches: forward hydrographic winch, A. Barton, all electric 12 HP, with 3,000 fms. of 5/32" wire; midship hydrographic winch, A. Barton, hydraulically driven, with 2,000 fms. of 5/32" wire; after hydrographic winch, A. Barton, 12 HP electric, with 600 fms. of 5/32" wire; trawl winch, Robertson-Lawrence-Scott, electric, 3 drum.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Has six laboratories: deck lab., fish handling lab., biology lab., darkroom, chemistry lab., and hydrographic lab. Total laboratory area 750 sq. ft. Each laboratory is fitted with modern equipment and gear for research and oceanographic and hydrographic survey.

### **HABITABILITY**

No information; presumable capable of extended voyages in all navigable waters.

### **OTHER FEATURES**

Hull strengthened for ice navigation. Has 1,800 cu. ft. fish hold.

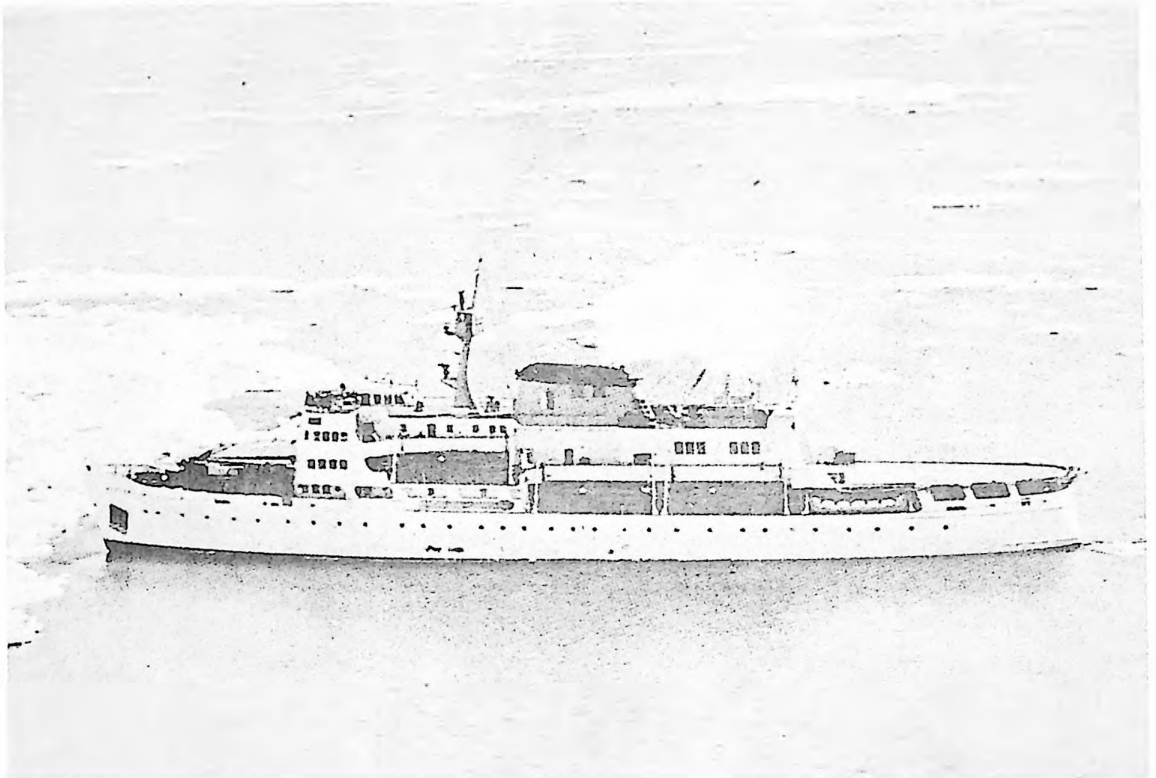
### **TYPE OF OBSERVATIONS**

Primarily used for fisheries research but also conducts oceanographic and hydrographic surveys.

### **REMARKS**

A sister ship, the G. B. REED is being built and should be ready in late 1963. She will operate in the North Pacific waters. She will be fitted with an 8-cylinder B&W ALPHA diesel engine, type 490, 1,000 BHP at 310 r.p.m., cruising range 8,500 miles. Scientific staff will come from the Nanaimo Biological Station of the Fisheries Research Board. Other specifications will be similar to the A. T. CAMERON.

# BAFFIN



**TYPE:** CGS, Hydrographic Survey, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
	285'	49'6"	16'6"	4,203 tons		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
13.5	15.5		14,000 miles	48 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
72	30

## **AFFILIATION**

Fisheries Research Board of Canada, Atlantic Oceanographic Group.

## **PROPULSION**

Fairbanks Morse opposed piston, twin screws, 7,060 shaft HP.

## **ELECTRICAL POWER**

Has 440V AC three-phase, 60-cycle; 220V AC; 110V AC; 115V AC, two-phase in laboratory outlets. DC also available.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

No information, but believed to have the latest equipment on board.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has two winches: Bergen Nautik, 8 HP, with 4,200 ft. of 5/32" wire; Kelvin Hughes, 25 HP, with 3,000 ft. of 3/32" wire.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Oceanographic and hydrographic (charting). Total laboratory area 1,134 sq. ft.

## **HABITABILITY**

No information, presumed capable of extended voyages in all navigable waters.

## **OTHER FEATURES**

Has helicopter platform with two helicopters.

## **TYPE OF OBSERVATIONS**

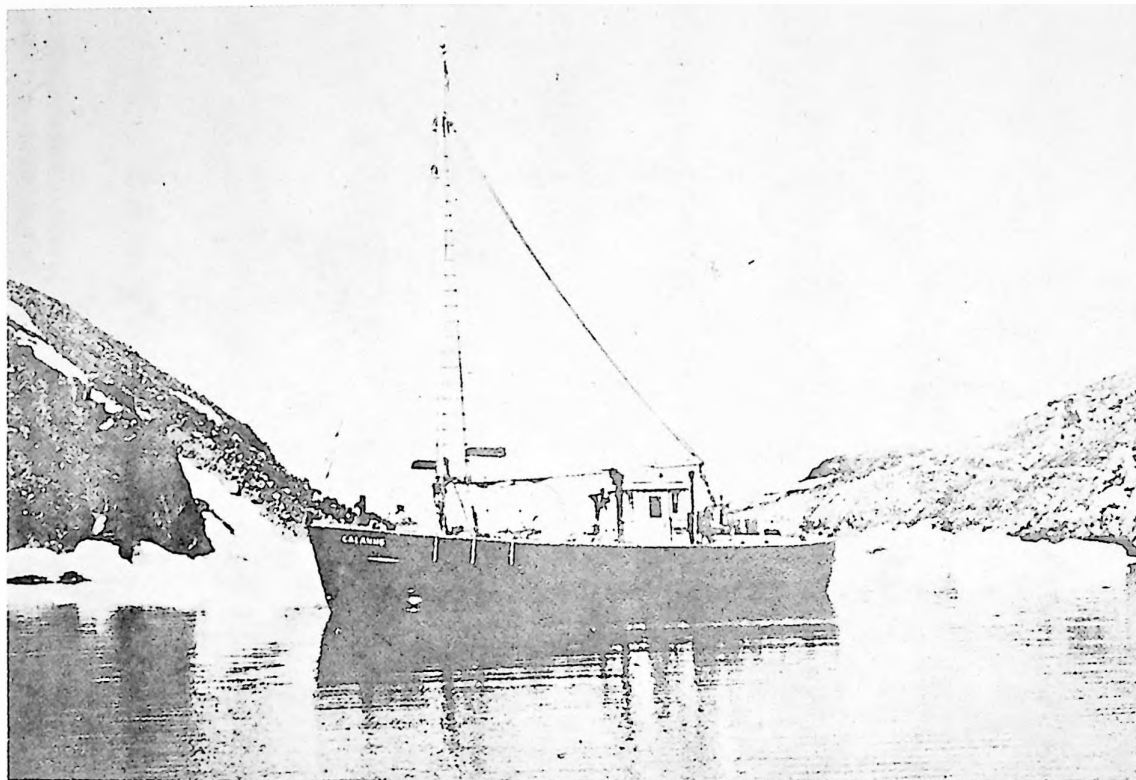
Oceanographic and deep sea sounding.

## **REMARKS**

None.



# CALANUS



**TYPE:** MV, wooden hull, with steel sheathing on prow, and extra wood sheathing (greenheart) from waterline down.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
	49'6"	15'	7'	42 tons loaded		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
	6.5		1,000 miles	10-15 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
3	1-2

## **AFFILIATION**

Fisheries Research Board of Canada.

## **PROPULSION**

Has Caterpillar diesel and Lister diesel auxiliary. Single screw, 77 HP. Auxiliary sails.

## **ELECTRICAL POWER**

Has 32V DC.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

No information on navigation, communication and echo sounding equipment.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One hydraulic (main) winch, 4,000 lbs. with 1,500 ft. of 5/16" wire on each of two drums for trawling and plankton hauling. One hydraulic winch, 990 lbs. with 3,000 ft. of 1/8" wire for hydrographic casts.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Two laboratories for biological and chemical work. Total area 42 sq. ft.

## **HABITABILITY**

No information.

## **OTHER FEATURES**

"A" frames for side trawling.

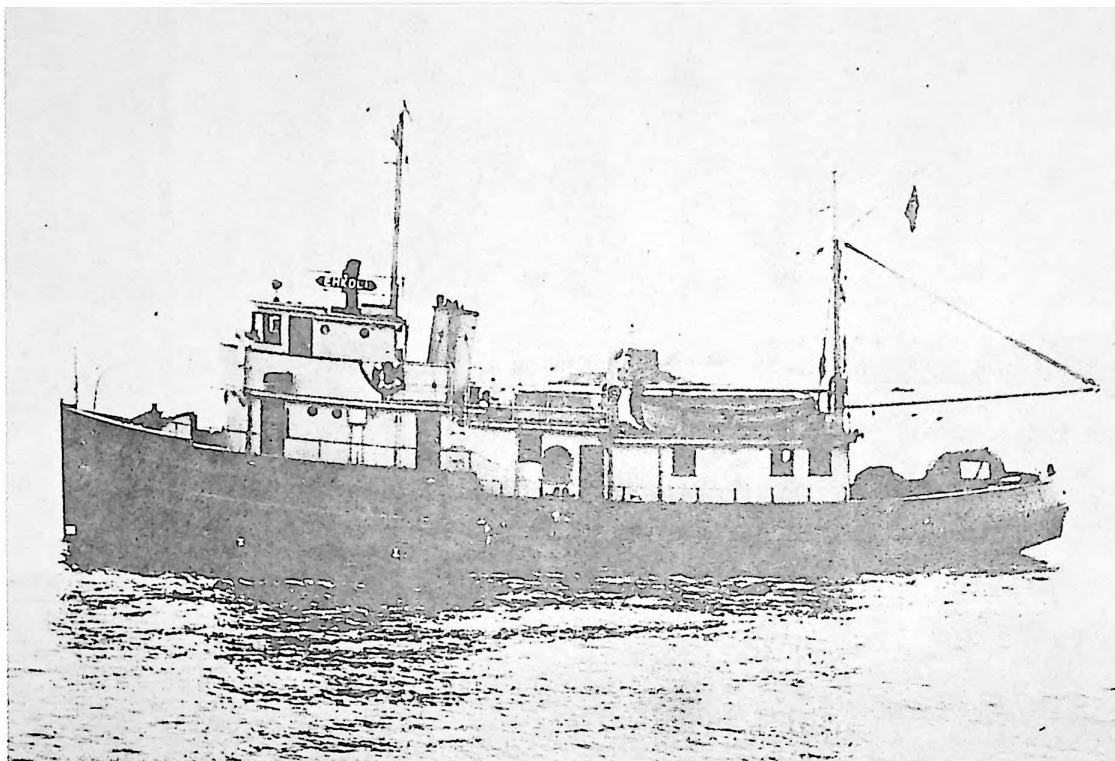
## **TYPE OF OBSERVATIONS**

Trawling, plankton hauling, hydrographic casts.

## **REMARKS**

Principally used for biological oceanography, fisheries and marine mammal investigations, in the eastern Canadian Arctic.

# EHKOLI



**TYPE:** MV, converted for oceanographic research.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
	84' 6"	20'	9'	154 tons		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
8	10		1,296 miles	over 6 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
17	6

**AFFILIATION**

Fisheries Research Board of Canada, Pacific Oceanographic Group.

**PROPULSION**

Diesel engine, single screw, 300 IHP.

**ELECTRICAL POWER**

Has 110V AC.

**NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

No information.

**HYDROGRAPHIC WINCHES AND EQUIPMENT**

Electric winch with Graham transmission, carries 6,000 ft. of wire.

**ACOUSTICAL CHARACTERISTICS**

No information.

**LABORATORIES**

One oceanographic laboratory, 60 sq. ft.

**HABITABILITY**

No information.

**OTHER FEATURES**

No information.

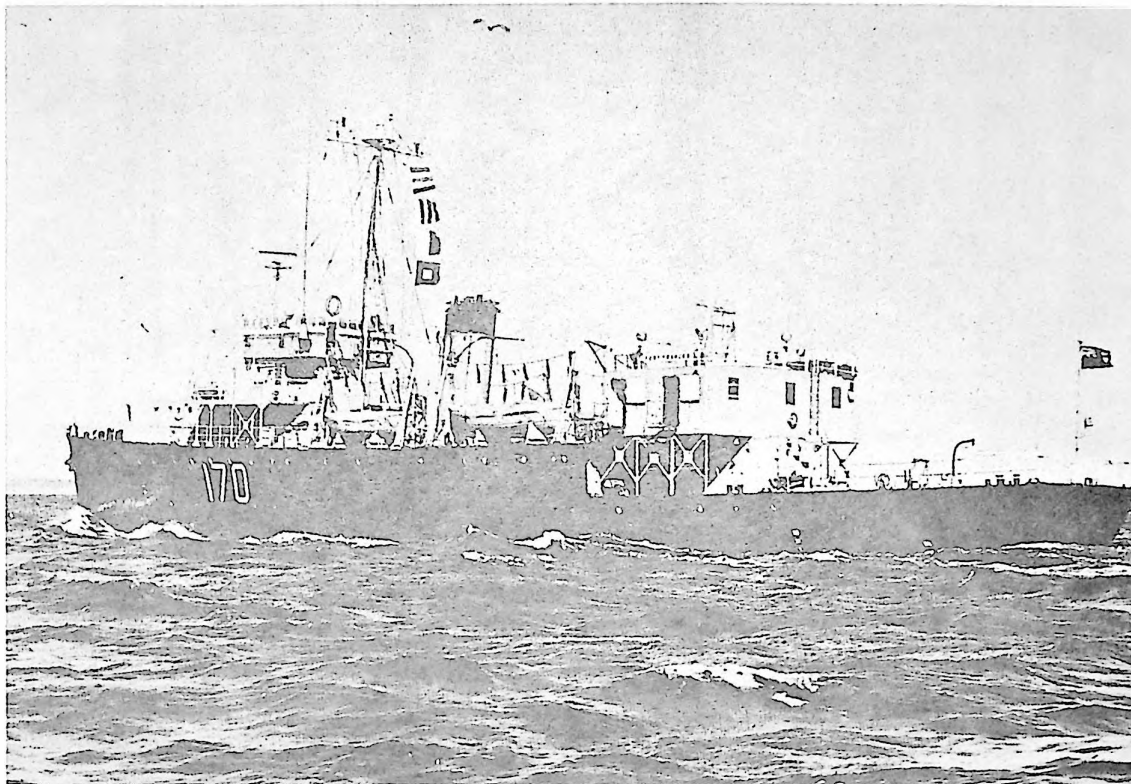
**TYPE OF OBSERVATIONS**

Oceanographic Research.

**REMARKS**

Refitted in April 1961.

## FORT FRANCES



**TYPE:** AGH-170, former ALGERINE Class Minesweeper, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1943	225'	35'6"	10'	1,335 tons		

### PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
9.8	16		4,060 miles	18 days

### COMPLEMENT

CREW	SCIENTIFIC STAFF
40	8

## **AFFILIATION**

Fisheries Research Board of Canada, Atlantic Oceanographic Group.

## **PROPULSION**

Triple expansion, steam, reciprocating, 3 crank, twin screw, 2,500 IHP. Can cruise 18 days on 100% fuel or 11 days with 40% remaining.

## **ELECTRICAL POWER**

Has 110V AC, 110V DC, and 220V DC.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

No information, but presumably equipped much the same as OSHAWA (AGH-174).

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has two winches: New England trawler (electric), 15 HP, with 20,000 ft. of 5/32" wire and BT (electric), 5 HP, with 3,000 ft. of 1/8" wire and 5,400 ft. of 3/32" wire.

## **ACOUSTICAL CHARACTERISTICS**

Principal use is for underwater acoustic research.

## **LABORATORIES**

Has three laboratories for oceanographic and acoustic research. Total area: 386 sq. ft. forward and 520 sq. ft. aft including oceanographic winch space.

## **HABITABILITY**

Ship capable of working in Arctic or tropics.

## **OTHER FEATURES**

No information.

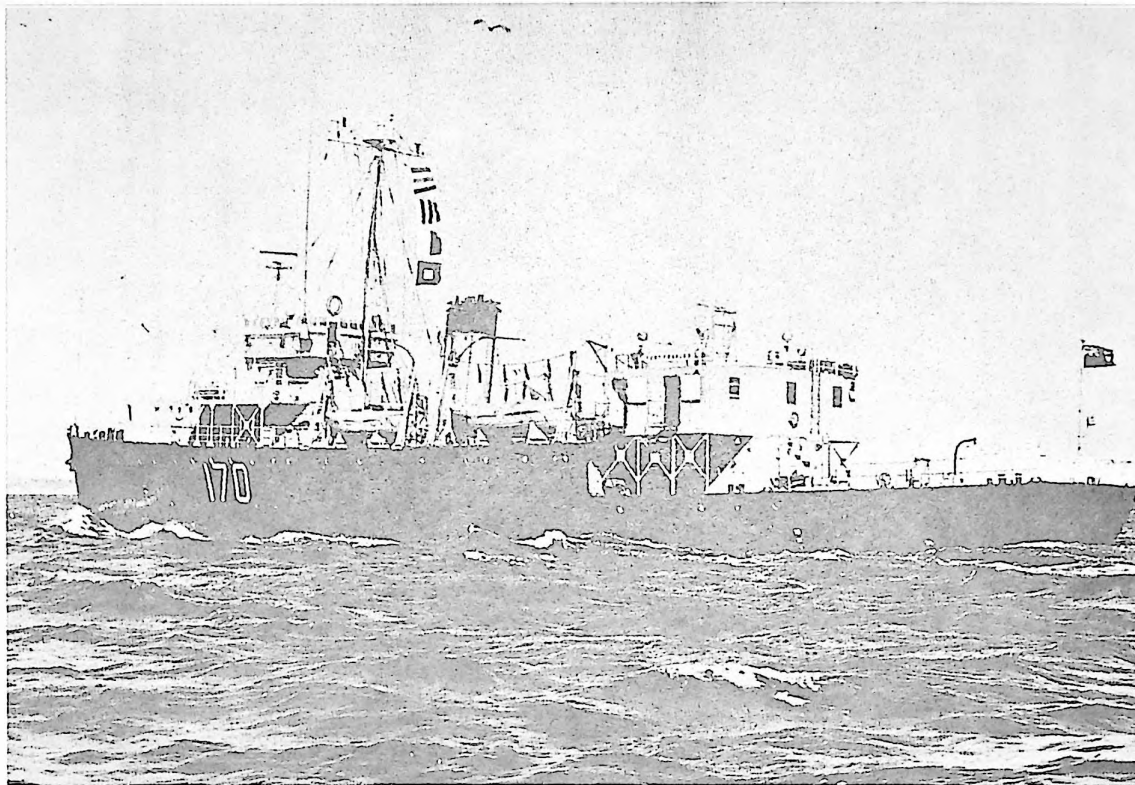
## **TYPE OF OBSERVATIONS**

BT, oceanographic, and acoustic research.

## **REMARKS**

None.

## FORT FRANCES



**TYPE:** AGH-170, former ALGERINE Class Minesweeper, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1943	225'	35'6"	10'	1,335 tons		

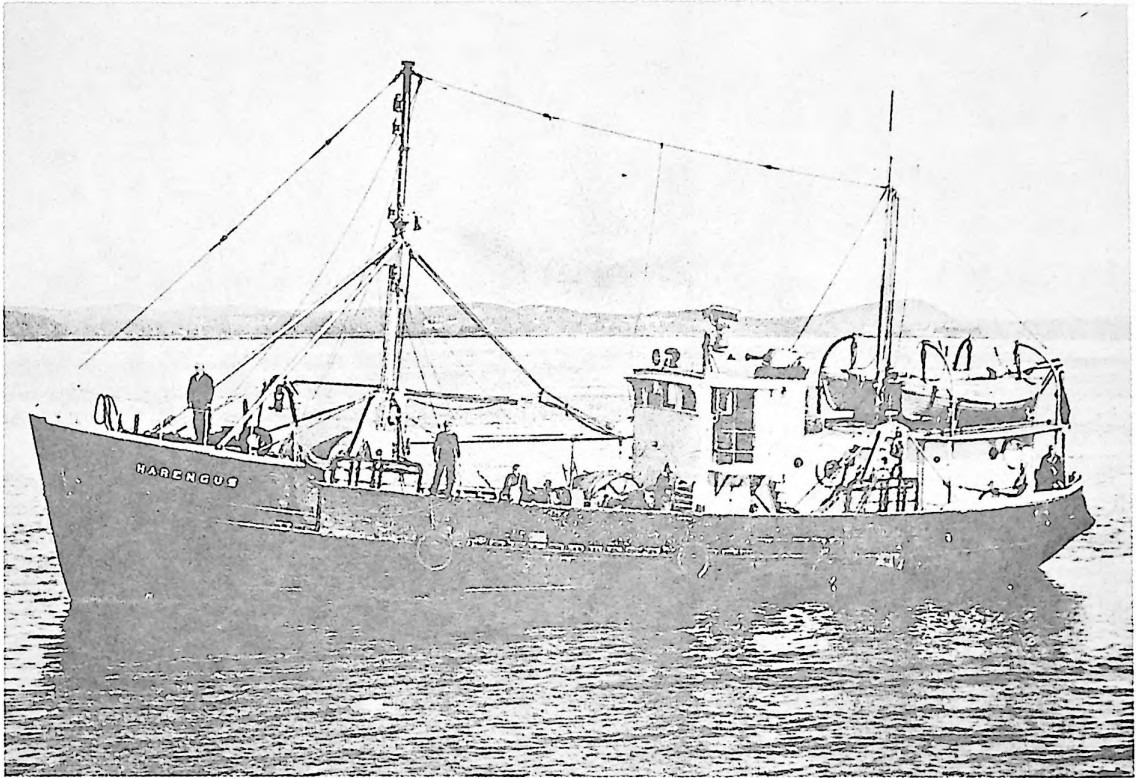
### PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
9.8	16		4,060 miles	18 days

### COMPLEMENT

CREW	SCIENTIFIC STAFF
40	8

# HARENGUS



TYPE: MV, Trawler type, wooden hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
	84'	20'	12'6"		109.2	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
	9			7 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
9 (total)	



**AFFILIATION**

Fisheries Research Board of Canada, Atlantic Oceanographic Group.

**PROPULSION**

Two 135 HP Caterpillar diesels, single screw, 270 shaft HP.

**ELECTRICAL POWER**

Has 32V DC.

**NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Radar and loran.

Communication - No information.

Echosounding - Two echosounders.

**HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has two winches: Hatheway 2 drum, P.T.O. main engine, with 5/8" wire and a hydrographic, electric, with 1,200 ft. of 1/8" aircraft cable.

**ACOUSTICAL CHARACTERISTICS**

No information.

**LABORATORIES**

None.

**HABITABILITY**

No information.

**OTHER FEATURES**

No information.

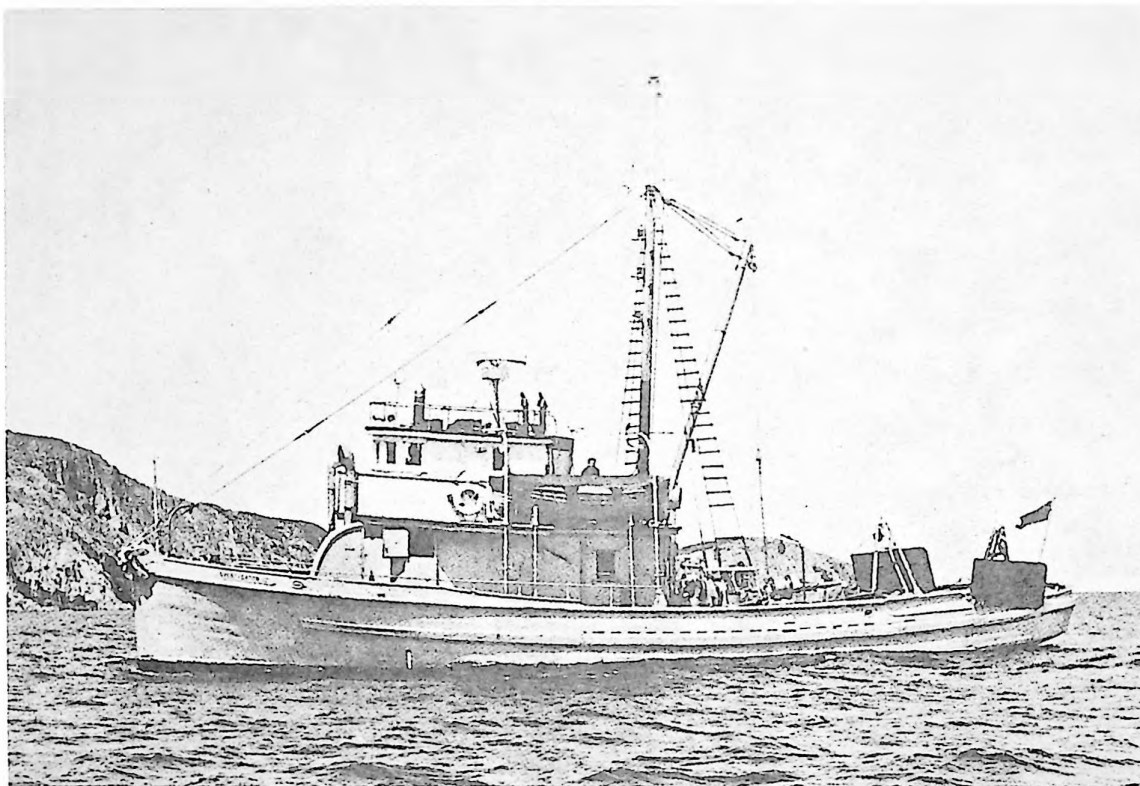
**TYPE OF OBSERVATIONS**

Fisheries research and oceanography.

**REMARKS**

None.

## INVESTIGATOR II



**TYPE:** MV, Fishing Vessel, wooden hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
	85'	22'	10'	110 tons (full)		

### PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
	9		1,800 miles	12 days

### COMPLEMENT

CREW	SCIENTIFIC STAFF
9	2

**AFFILIATION**

Fisheries Research Board of Canada, Atlantic Oceanographic Group.

**PROPULSION**

Atlas Imperial, single screw, 250 HP.

**ELECTRICAL POWER**

Has 110V DC.

**NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - No information.

Communication - No information.

Echosounding - Three echo sounders including Fishlupe.

**HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has two winches: Bergen Nautik, 3 HP, 110V DC, with 5,000 ft. of 5/32" wire; Northern Draggar (powered from main engine), with 3,000 ft. of 5/8" wire.

**ACOUSTICAL CHARACTERISTICS**

No information.

**LABORATORIES**

None.

**HABITABILITY**

No information.

**OTHER FEATURES**

No information.

**TYPE OF OBSERVATIONS**

Groundfish investigations and associated oceanography.

**REMARKS**

Generally employed on Grand Banks.

# LABRADOR



**TYPE:** AW-50, Arctic Patrol Vessel. An icebreaker engaged in oceanographic research.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1954	269'	63'9"	26'	5,300 tons	26'	
				6,900 tons	29'	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
10	17		35,000 miles	145 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
90	18

## **AFFILIATION**

Fisheries Research Board of Canada, Atlantic Oceanographic Group.

## **PROPULSION**

Six Fairbanks Morse diesels, two-cycle, opposed piston. Twin screws, 12,000 HP.

## **ELECTRICAL POWER**

Has four 220V AC, 250 KVA generators and 440V DC.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

No information, but presumably has all the latest equipment.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has two winches: New England Trawler, 15 HP, with 20,000 ft. of 5/32" wire. Deck winches (two), 5 ton capacity, with 300 ft. of 7/8" wire.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

One laboratory for chemical and general use, total area 24 sq. ft.

## **HABITABILITY**

No information; presumably capable of extended voyages in all navigable waters. Nine double cabins available for scientists.

## **OTHER FEATURES**

Carries helicopter platform and two helicopters. Machine shop. Fitted Denny-Brown stabilizers. Propelling machinery may be controlled from bridge.

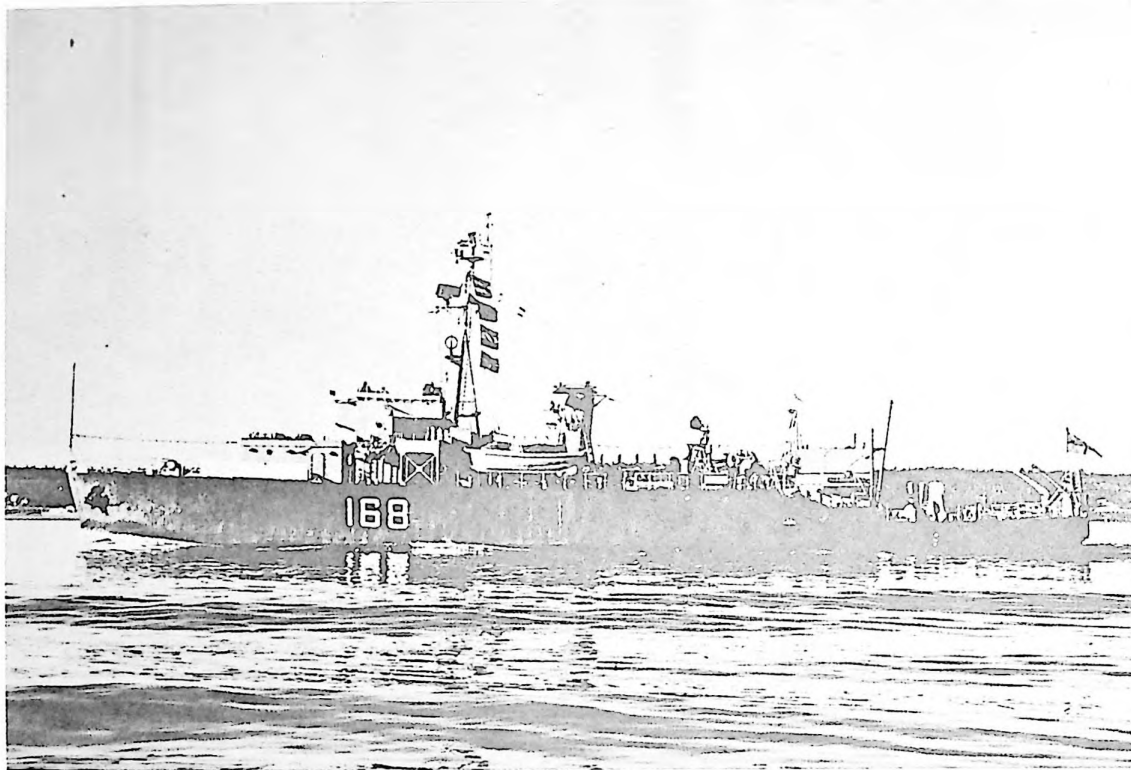
## TYPE OF OBSERVATIONS

Oceanographic research, hydrography, meteorology, cosmic ray research, ice reconnaissance and other scientific work.

## REMARKS

First naval vessel to sail through the North West Passage and to circumnavigate North America. Has steel sides 2" thick and heating tanks built into her. Has aircraft hanger and flight deck. Carries two landing craft strengthened against ice.

## NEW LISKEARD



**TYPE:** AGH-168, former ALGERINE Class Minesweeper, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1944	225'	35'7"	11'	1,335 tons (full)		

### PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
9.8	16		4,060 miles	18 days

### COMPLEMENT

CREW	SCIENTIFIC STAFF
40	9

## **AFFILIATION**

Fisheries Research Board of Canada, Atlantic Oceanographic Group.

## **PROPULSION**

Triple expansion steam reciprocating, three crank, twin screw, 2,500 IHP. May cruise 18 days on 100% fuel or 11 days with 40% fuel remaining.

## **ELECTRICAL POWER**

Has 24V DC, 110V AC, 110V DC, and 220V DC.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

No information, but presumably equipped much the same as OSHAWA (AGH-174).

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has seven winches. Bollard (electric) for NRE over side handling. Bollard (electric), 2.75 HP ammunition hoist. Special electric NRE Derrick Topping lift. Special electric NRE Acoustic cable. New England Trawler (electric), 15 HP, with 30,000 ft. of 5/32" wire. BT (electric) with 3,000 ft. of 1/8" wire and 5,400 ft. of 3/32" wire.

## **ACOUSTICAL CHARACTERISTICS**

Principal use is underwater acoustic research.

## **LABORATORIES**

Two laboratories for oceanographic and acoustic research. Forward 374 sq. ft.; aft. 280 sq. ft.; workshop aft. 280 sq. ft.

## **HABITABILITY**

No information; presumably capable of extended voyages in all navigable waters.

## **OTHER FEATURES**

No information.



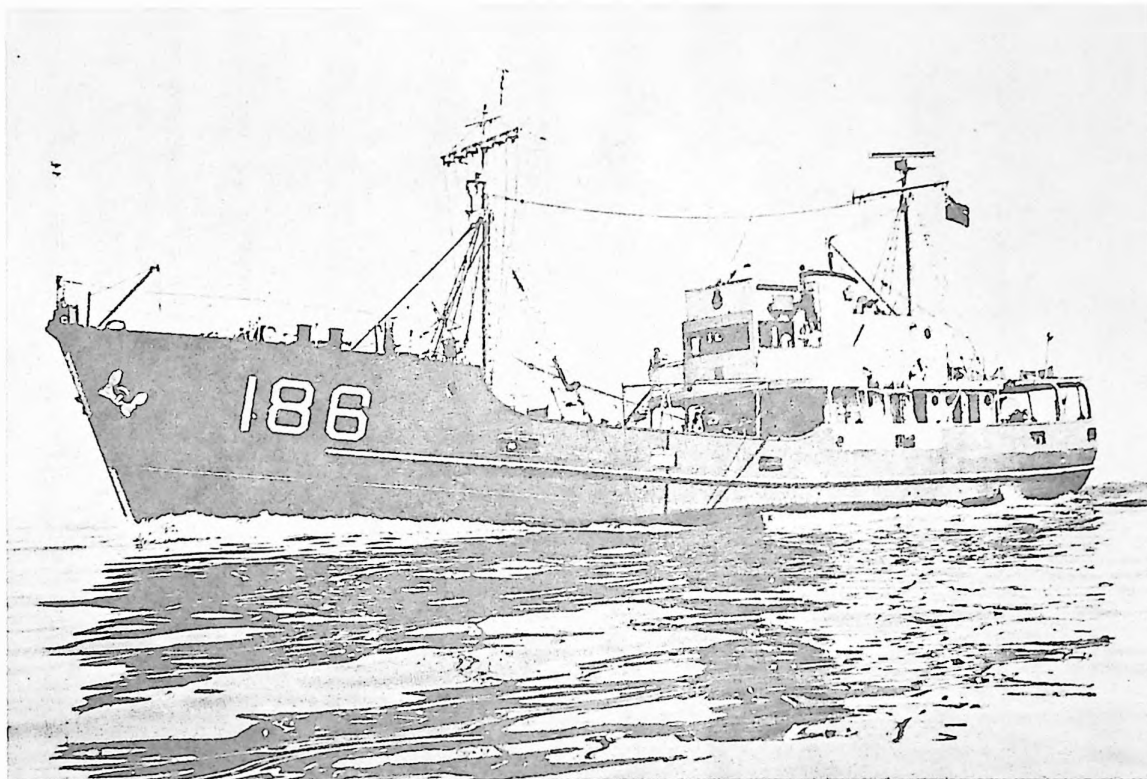
**TYPE OF OBSERVATIONS**

BT, oceanographic, and acoustic research.

**REMARKS**

None.

## PORT DAUPHINE



TYPE: CMS, Trawler, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
	125'	25'3"	10'5"	319 tons (loaded)		

### PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
	11.5		1,600 miles	7 days

### COMPLEMENT

CREW	SCIENTIFIC STAFF
13	3-8

## **AFFILIATION**

Fisheries Research Board of Canada.

## **PROPULSION**

Dominion Alco diesel, single screw, 600 HP.

## **ELECTRICAL POWER**

Has 110V AC and DC.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

No information on navigation, communication and echosounding equipment.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has five winches: one Electric Kelvite (110V DC) with 2,000 ft. of 1/8" wire. Two electric winches, 3/4 HP, 110V AC, with 1,000 ft. of 1/8" wire; one electric winch, 1 HP dual 110V AC with 1,500 ft. of 3/16" to 1/4" tapered wire; and one gasoline winch 22-1/2 HP, with 1,200 ft. of 3/8" wire.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Three laboratories for drafting, physical and chemical work.

## **HABITABILITY**

No information.

## **OTHER FEATURES**

No information.

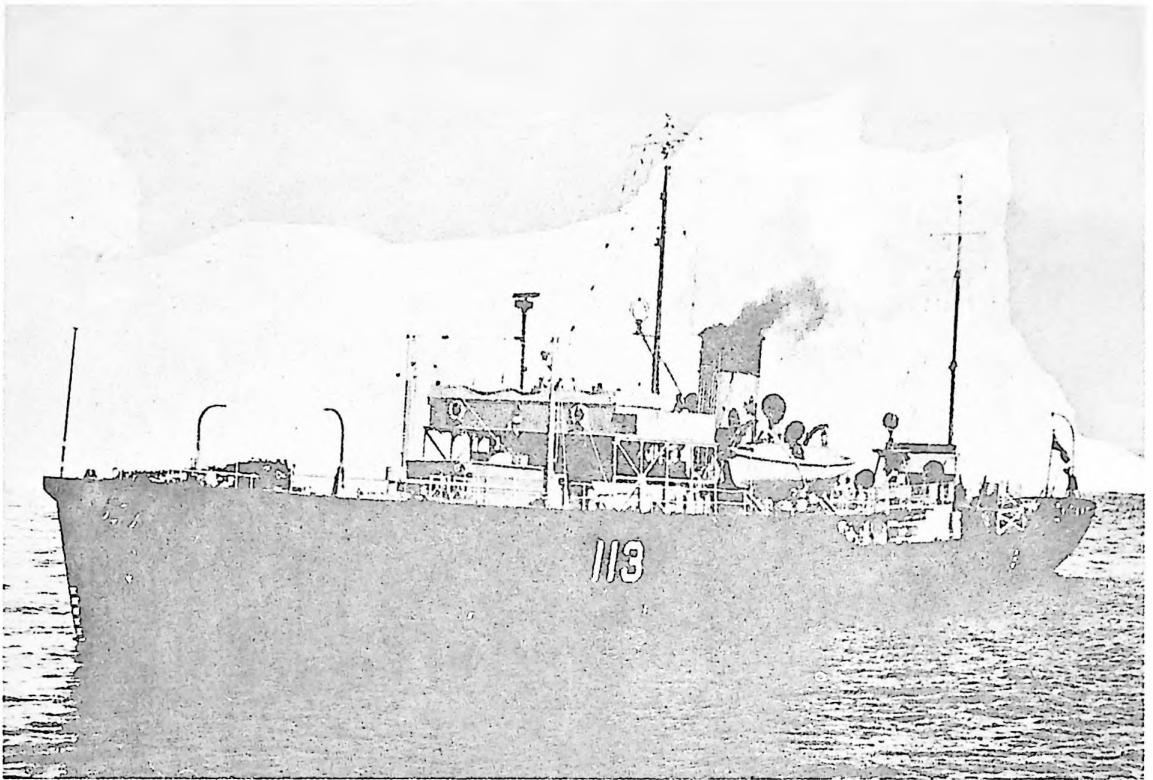
## **TYPE OF OBSERVATIONS**

Bottom dredging, BT, water sampling, plankton hauls, gravity coring and piston coring.

## **REMARKS**

Used for Great Lakes surveys.

## SACKVILLE



TYPE: CNAV, ALC 113, Corvette Type (designated cable layer).

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1941	205'1"	33'1"	9.2' fwd 12.0' aft	1,177 tons (loaded)		

### PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
12	16		2,540 miles	12 days

### COMPLEMENT

CREW	SCIENTIFIC STAFF
31	7

## **AFFILIATION**

Fisheries Research Board of Canada, Atlantic Oceanographic Group.

## **PROPULSION**

Steam reciprocating, single screw, 2,750 IHP. May cruise 12 days at 100% fuel or 9 days with 40% fuel remaining.

## **ELECTRICAL POWER**

Has 110V DC, 60 KW; 110V DC, 40 KW; and 110V AC, 15 KVA (laboratories only).

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyroscope repeater, Chernikееff repeater, Decca Marine Navigator.

Communication - No information.

Echosounders - Precision Depth Recorder, Kelvin Hughes echosounder MS21J.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has five winches. Bergen Nautik, 5 1/2 HP, with 20,000 ft. of 5/32" wire. New England Trawler (electric), 15 HP, with 20,000 ft. of 3/16" wire. Kelvin Hughes, 3 HP, with 1,500 ft. of 3/32" wire. Steam winch, 5 ton lift, with 2,000 ft. of tapered 3/16" to 1" wire. Target towing winch, 2 1/2 HP, with 2,000 ft. of 3/16" wire.

## **ACOUSTICAL CHARACTERISTICS**

No information

## **LABORATORIES**

Has five laboratories: chemical and biological, electronics, winch (wet) laboratory, workshop, and auxiliary winch laboratory.

## **HABITABILITY**

No information.

## OTHER FEATURES

Portable depth charge racks for seismic surveys.

## TYPE OF OBSERVATIONS

Recording equipment for sea surface, air and wet bulb temperatures, geomagnetic electrokinetograph, wind anemometer repeater.

## REMARKS

Listed as a cable layer under NATO nomenclature.

# SALVELINUS

NO PHOTO AVAILABLE

**TYPE:** MV, wooden hull, strengthened for Arctic conditions, greenheart sheathing and steel prow sheathing.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
	38'	12'	3'8"	15 tons (loaded)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
	8.6		500 miles	10 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
1	1-2

## **AFFILIATION**

Fisheries Research Board of Canada.

## **PROPULSION**

Has GM 4071 C diesel, Onan 3 KW auxiliary. Single screw, 80 HP.

## **ELECTRICAL POWER**

Has 32V DC from nickel-cadmium batteries.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - No information.

Communication - 105W radio telephone.

Echosounders - Kelvin Hughes MS-29 echosounder.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One hydraulic trawling winch, 3,000 lbs., with 1,000 ft. of 3/8" wire. Equipped with hydraulic power block at end of boom. "Single" American trawl set-up.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

None.

## **HABITABILITY**

No information.

## **OTHER FEATURES**

Special shallow-draft design for working in MacKenzie Delta and other inshore regions.

## **TYPE OF OBSERVATIONS**

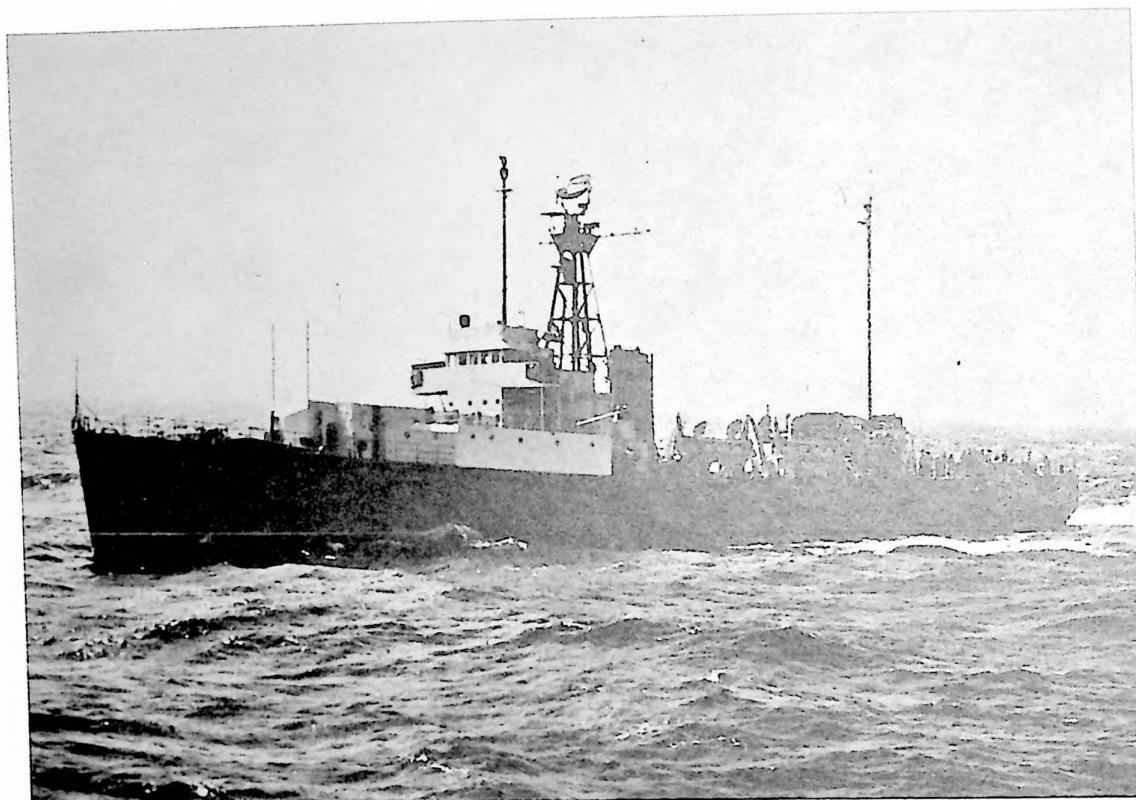
Trawling.

## **REMARKS**

Small hydrographic winch and MK 22 Sperry gyro, are being placed aboard. Used mainly in the western Canadian Arctic.



# STONETOWN



**TYPE:** CGS, Ex-Royal Canadian Navy Frigate (River Class), steel hull, adapted for ocean weather station service.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1944	286'5"	36'7"	14'2" (full)	1,368.5 tons (light)	1,895	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
12	19	3	7,900 miles	7 weeks

## COMPLEMENT

CREW	SCIENTIFIC STAFF
43	2

## **AFFILIATION**

Operated by the Ministry of Transport for the Fisheries Research Board of Canada, Pacific Oceanographic Group.

## **PROPULSION**

Steam reciprocating, triple expansion engines, with two fixed-blade propellers, 5,500 IHP shaft. Carries 930 tons Bunker "A" fuel oil.

## **ELECTRICAL POWER**

Ship generates 120 KW. Required for normal ship operation, 55 KW. Characteristics: 110V AC, 9 KVA (2 generators); 220V AC, 60 KVA (2 generators); 220V AC, auxiliary, 60 KVA. Also has batteries for emergency use.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Loran, gyrocompass, magnetic compass, patent log (Walker Trident), radar (277W Decca 45, Decca 159), and direction finder.

Communication - Frequencies as specified for Ocean Weather ship operations, including UHF, CW equipment and VHF radio-telephone, with voice transmissions.

Echosounders - Hughes echosounder (Type MS21, 120 ft. to 120 fms., 720 ft. to 720 fms.) Domes not fit for soundings below 300 fms.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Kelvin Automajor BT winch 7 1/2 HP, with 2,000 ft. of 3/32" wire.

## **ACOUSTICAL CHARACTERISTICS**

Ship cannot be put in noiseless condition.

## **LABORATORIES**

Meteorological office on ship from which radiosonde measurements are made.

## **HABITABILITY**

Comfortable quarters for middle latitudes. Carries 60 tons fresh water; has distillation apparatus. No salt water showers.

## OTHER FEATURES

Bilge keels.

## TYPE OF OBSERVATIONS

Primarily used for ocean weather station service. Makes twice-daily BT observations, stopped or underway at 5 kts.

## REMARKS

This ship mans Ocean Weather Station "P" (lat. 50°N, long. 145°W), alternating with "ST. CATHARINES" every six weeks. Oceanography secondary to normal duties of meteorology, search and rescue, navigational aid to ocean traffic (direction finder, radar, and beacon), communications, and bird and marine mammal population studies.

# CHILE

## SECTION 9

# YELCHO



TYPE: Formerly U.S.S. Tekesta (ATF 93), Sea-going Tug.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1943	205'	39'	13'9"	1,732 tons		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
12.5	16.5		8,000 miles	

## COMPLEMENT

CREW	SCIENTIFIC STAFF
64	(total)

**AFFILIATION**

Chilean Navy.

**PROPULSION**

Four sets of diesels with electric drive, 3,000 BHP.

**ELECTRICAL POWER**

Has 120V DC from two 100 KW and one 60 KW generators.

**NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Loran (DAS-4) and radar (Raytheon Mariner Pathfinder).

Communication - Transmitters - TBL-7-CW, CRV-50005-voice amplifier  
CIH-52245A trans., CIH-46159A Red. Receivers - CAY-46077, CCT-46217,  
RD2. Wide range of frequencies.

Echosounder - AN/UQN-1D.

**HYDROGRAPHIC WINCHES AND EQUIPMENT**

None.

**ACOUSTICAL CHARACTERISTICS**

No information.

**LABORATORIES**

None.

**HABITABILITY**

No information.

**OTHER FEATURES**

No information.

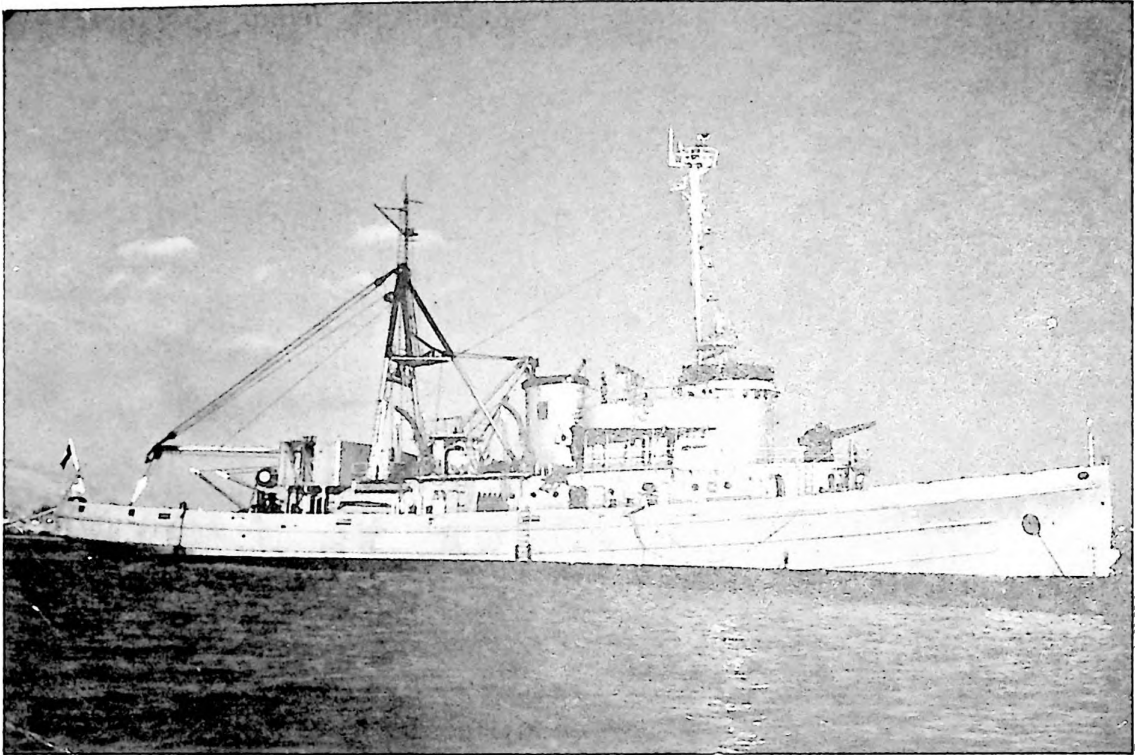
### **TYPE OF OBSERVATIONS**

No information.

### **REMARKS**

A Chilean commission has been investigating the possibility of outfitting vessel as an oceanographic ship. At this time it is not known if this ship is operating in this capacity.

# YELCHO



**TYPE:** Formerly U.S.S. Tekesta (ATF 93), Sea-going Tug.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1943	205'	39'	13'9"	1,732 tons		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
12.5	16.5	1	8,000 miles	50

## COMPLEMENT

CREW	SCIENTIFIC STAFF
87	12



## **AFFILIATION**

Departamento De Navegacion E. Hidrografia De La Armada. Valparaiso, Chile.

## **PROPULSION**

Four sets of diesels with electric drive, 3,000 BHP. One propeller. Fuel tank capacity 356.0 liters diesel oil.

## **• ELECTRICAL POWER**

Kilowatts generated by ship: two 200 KW and one 60 KW 115V DC diesel generators. One 62.8 KW 230V DC generator driven by 115V DC electric motor. Available AC, 41.7 amps. 120V AC 60-cycle. Kilowatts available for scientific equipment: 60 KW 115V DC, 62.8 KW 230V DC and 4 KW 120V AC 60-cycle.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation: Loran (DAS-4) and radar (Raytheon Mariner Pathfinder).

Communication: Transmitters : TBL-7-CW, CRV-50005-voice amplifier CIH-52245A trans., CIH-46159A Red. Receivers: CAY-46077, CCT-46217, RD2. Wide range of frequencies.

Echosounders: AN/UQN-1D.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One Bergen Nautik electrical hydrographic winch with 4,800 m. of 3/16" wire. A portable hydrographic winch with 4,500 m. of 5/32" wire. One bathythermograph winch. A double-barrelled towing winch; the barrels can be used for heavy work in shallow waters.

## **ACOUSTICAL CHARACTERISTICS**

Ship cannot be put in noiseless condition.

## **LABORATORIES**

Two laboratories (180 sq.ft. each). Portside laboratory is multi-purpose, has 110V AC, 110V DC, hot and cold fresh water. Starboard side laboratory keeps hydrographic winch and Nansen bottles; has 110V AC, 110V DC, hot and cold fresh water and cold salt water. Machine shop.

## **HABITABILITY**

Ship can work in tropics or Antarctic. Carries 100 tons of fresh water; daily consumption 7 tons; distillation capacity 12 tons/day.

## **OTHER FEATURES**

None

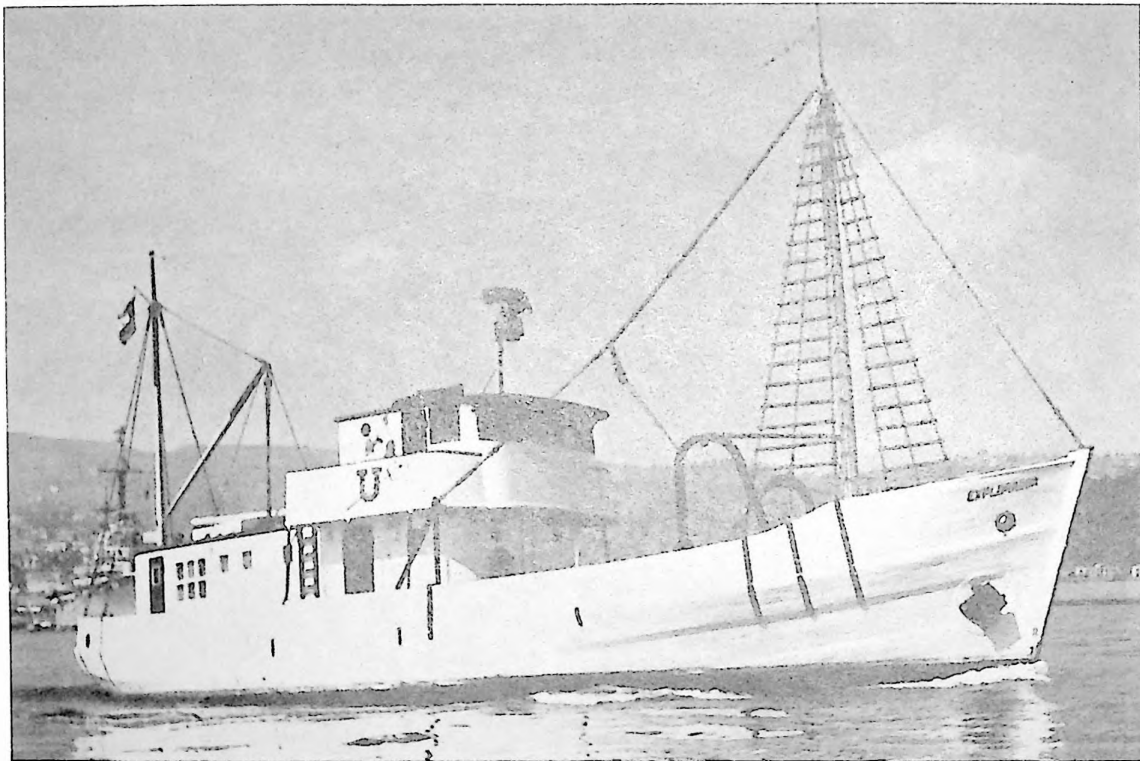
## **TYPE OF OBSERVATIONS**

Hydrographic casts, continuous bottom profile, dredging, trawling, coring, plankton, geomagnetics and BT.

## **REMARKS**

Ship was outfitted in October 1961 for oceanographic work.

## EXPLORADOR



**TYPE:** Designed and built as a Research Vessel, wooden hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1962	22.7m.	5.7m.	7'	90 tons	68.7	

### PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
8.5		1	1,200 miles	12 days

### COMPLEMENT

CREW	SCIENTIFIC STAFF
6	6

## **AFFILIATION**

Universidad de Chile, Estación de Biología Marina, Vina del Mar.

## **PROPULSION**

"Burmeister Wain" diesel engine with controllable pitch propeller, 200 HP; fuel capacity 10 tons.

## **ELECTRICAL POWER**

An auxiliary diesel engine operates one 110V AC generator of 8 KW. Batteries available for emergency radio communications.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Magnetic compass and radar ("Raytheon" Model 1500, 32 miles range).

Communication - Marine radio-telephone providing 80W output on eight channels, crystal controlled, for use on the 2000-8000 KC marine band.

Echosounders - "Atlas Werke" echosounder with graphic recording paper (scale range 0-200, 200-400, 400-600 and 0-1,000 m.); with optical indicator of fish schools on cathode-ray tube screen with a maximum range of 250 m. deep.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One hydraulic winch ("Norwinch," Bergen) with two drums carrying 10,000 ft. of 3/16" hydrographic wire and 6,000 ft. of 3/8" trawling wire, respectively. A boom and an "A" frame are used for each wire. The hydraulic pump is connected to the main engine of the ship and also operates the windlass.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

One laboratory (30 sq. ft.) is placed on port side and a larger one (60 sq. ft.) athwartships.

### **HABITABILITY**

Comfortable for short cruise.

### **OTHER FEATURES**

None.

### **TYPE OF OBSERVATIONS**

Hydrographic casts, net tows, bottom sampling, dredging, trawling, and surface water observations.

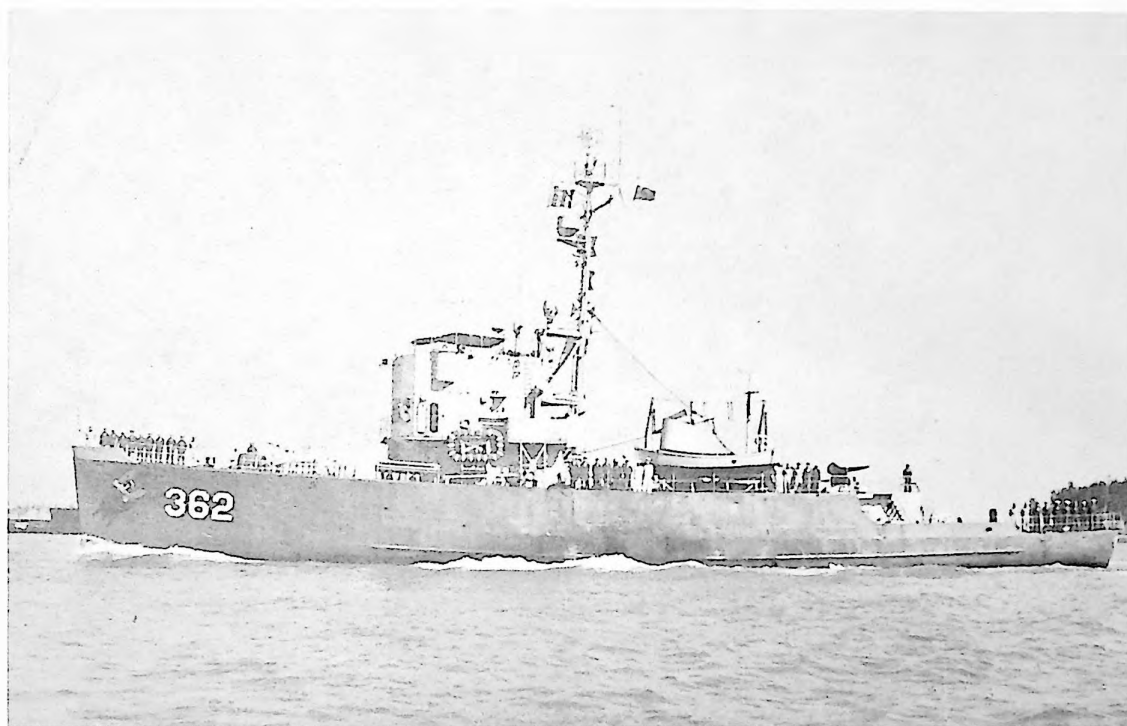
### **REMARKS**

The ship was put into service in November, 1962.

**REPUBLIC OF CHINA**

**SECTION 10**

# YANG MIN



**TYPE:** Mine Sweeper Frigate, converted into an Oceanographic Research Vessel.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1943	184'6"	33'	9'8"	880 tons		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
10	13		20,000 miles	

## COMPLEMENT

CREW	SCIENTIFIC STAFF
60	10

## **AFFILIATION**

Oceanographic Research Vessel of the Republic of China Navy

## **PROPULSION**

Diesel, twin screws. Uses diesel oil.

## **ELECTRICAL POWER**

Available for Scientific work: 440V AC, 60 KW, 60-cycle, and 110V DC. Constant frequency current available.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Radar and radio direction finder.

Communication - Transmitters - Westinghouse Model TBL-7; receivers RCA type CRV-46155 and VRV-46156.

Echosounders - One Bendix DR-12

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One electric oceanographic winch with 12,000' of 5/32" steel wire.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

One laboratory on upper deck with working space for 3 persons.

## **HABITABILITY**

No information.



**OTHER FEATURES**

No information.

**TYPE OF OBSERVATIONS**

Temperature, salinity, and current.

**REMARKS**

Hydrographic and oceanographic surveys.

# DENMARK

## SECTION 14

# ERIKA DAN



TYPE: Polar Vessel, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1958	298'7"	46'	21' (full)		2,647.6	1,332.6

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
	14.5 (full)			

## COMPLEMENT

CREW	SCIENTIFIC STAFF
85	(total)

## **AFFILIATION**

Owner: J. Lauritzen, Copenhagen. Oceanographic program conducted by Belgian National Center for Polar Research in collaboration with Belgian Royal Institute of Natural Sciences.

## **PROPULSION**

B & W two stroke, single acting, direct reversible diesel engine with turbo charge, 3,220 IHP. Fuel tank capacity about 533 tons.

## **ELECTRICAL POWER**

Each of three auxiliary engines coupled to 170 KW, 220V DC dynamo.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Direction finder, gyrocompass with automatic steering control, radar, Decca, and electric log.

Communication - Wireless transmitter and telephone (Signal letters OXDY).

Echosounders - Two available but reported to be non-operational at great depths.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Installation of oceanographic and other winches can be made as required.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Space can be made available for laboratories as required by survey specifications.

## **HABITABILITY**

Constructed as a "Polar" vessel. Has ventilation system that will renew air 19.5 times/hr. in empty holds. Can be used in all navigable waters. Carries 45 cu. m. of fresh water. Distillation capacity unknown.

### **OTHER FEATURES**

Hull strengthened for ice navigation. Equipped with 20 HP motor launch. Has four Atlas compressors for refrigeration machinery (refrigeration capacity is 2,990 cu. ft.).

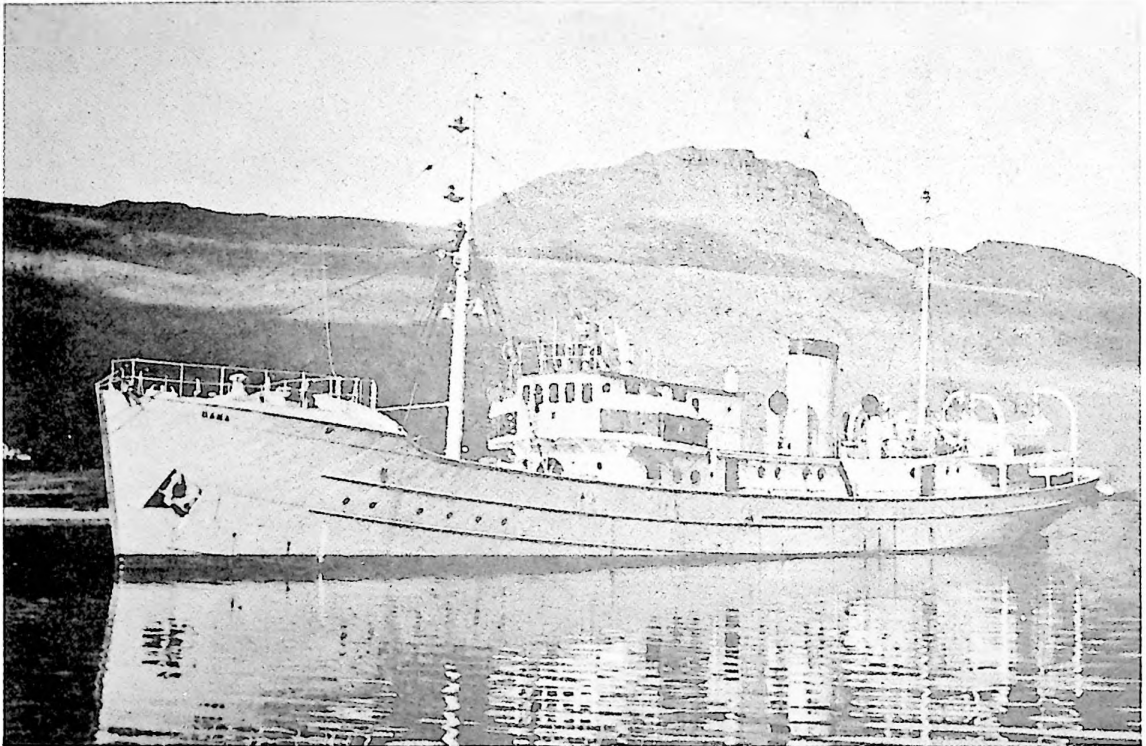
### **TYPE OF OBSERVATIONS**

Not specifically a survey ship but has done oceanographic work with minor modifications and additional equipment.

### **REMARKS**

Although a Danish owned vessel, has been used recently by Belgium for oceanographic survey work.

# DANA/OYTJ



TYPE: Steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1937	174.7'	28'	13.5'		490.4	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
10	8		10,000 miles	14 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
21	5

## **AFFILIATION**

Danmarks Fiskeri--og Havundersogelser, Charlottenlund Slot.

## **PROPULSION**

"Frichs" 4 stroke diesel, 700 HP at 280 r.p.m. Adjustable pitch propeller. Fuel oil capacity 90 tons.

## **ELECTRICAL POWER**

Has three "Frichs" 4 stroke diesel generators, two 80 KW and one 40 KW. Electric current is 220V DC.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Two radars, RCA with 20 mi. range and Kelvin Hughes, 48 mi. range. Also has Decca navigator MKV type 133.

Communication - Electromekano radios, S 264, 250W, and S 103 B, 70W.

Echosounders - One Kelvin Hughes, 15 KC, 10,000 m., one Atlas 50 KC, 1,200 m., and one Bendix, 50 KC, 400 ft.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Three Thrige, Ward Leonard electric-motor generator winches, one 12 HP with 5,000 m. cable, one 7 HP with 500 m. cable and one 14 HP with 1,000 m. cable. Also has a Thrige, Ward Leonard diesel generator trawl winch, 80 HP, 70 tons, with 4,000 m. cable.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Has a total of 27 sq. m. laboratory space.

## **HABITABILITY**

Fresh water tank capacity 58 tons.

## OTHER FEATURES

No information.

## TYPE OF OBSERVATIONS

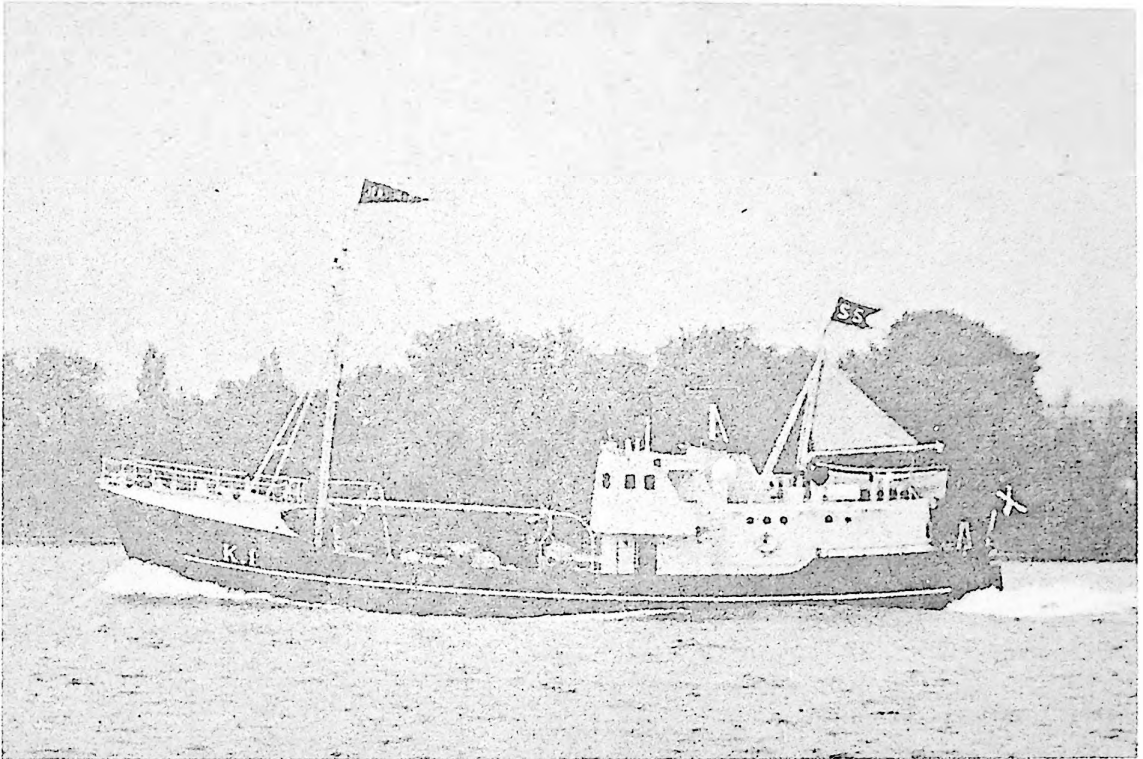
Hydrographic casts, BT, plankton hauls, bottom samples, hydrographic survey, fisheries research.

## REMARKS

Has worked in the North Atlantic, North Sea, and the Greenland and Norwegian Seas.



# JENS VAEVER



TYPE: Trawler type, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1960	100' 2"	20' 10"	10' 4"		141.9	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
9	11.5		2,600 miles	8-10 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
9	2

## **AFFILIATION**

The Danish Ministry of Fishery.

## **PROPULSION**

B & W Alpha diesel type 406 VO, 420 HP at 375 r.p.m., with controllable pitch propeller. Carries 20.6 tons of fuel oil.

## **ELECTRICAL POWER**

Two generators: A/S Frichs type 4100C, 30 HP at 1,200 r.p.m.; and A/S Frichs type 4100C 18 HP at 750 r.p.m. Has 110V DC current.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Kelvin Hughes radar, Decca navigator, and 70W direction finder.

Communication - Dansk Radio A/S type telefoni.

Echosounders - Elac/Atair

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

T.B. Thrige, electric 8 HP hydrographic winch with 5,000 ft. of cable. Andreas Jensen, mechanical trawl winch with 9,600 ft. of cable. Drag-net winch, Andreas Jensen-type electric 12 HP.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Space available on deck 40.0 sq. ft.

## **HABITABILITY**

Carries 7.3 tons of fresh water.

## OTHER FEATURES

Atlas cargo cooling plant.

## TYPE OF OBSERVATIONS

Exploratory fishing, oceanographic, and biological observations. No permanent equipment. Instruments from the Danish Institute for Fisheries and Research are placed on board according to work requirements.

## REMARKS

Vessel is sea kindly. Generally works in the Baltic sea.

# NELLA DAN

NO PHOTO AVAILABLE

**TYPE:** Cargo and passenger ship, ice strengthened, specially built for Antarctic service. All welded construction.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1961	246'8"	46'11"	21'6"	3,675 tons	2,206	1,060

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
	13		28,000 miles	

## COMPLEMENT

CREW	SCIENTIFIC STAFF
35	42

## **AFFILIATION**

Lauritzen Lines polar fleet. Danish built ship, was on charter to the Australian National Antarctic Research Expeditions during 1961-62 season.

## **PROPULSION**

Has 8-cylinder, two stroke, single-acting, direct reversible diesel engine, developing 2,240 BHP at 300 r.p.m. and coupled to a single, left-handed, four bladed variable pitch propeller. Fuel capacity 736 tons. Astern there are 3 broad horizontal fins on each side of the hull, in front of the propeller, which help to keep ice clear of the propeller while an ice-knife protects the rudder from damage when going astern in ice.

## **ELECTRICAL POWER**

Three diesel generators.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Twin radar sets, direction finding apparatus, electric log, gyro and magnetic compasses, automatic gyro-pilot.

Communication - No information, presumably well equipped.

Echosounders - Vessel is equipped with echosounders.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Equipped with two 10 ton derricks, one 20 ton derrick, and one 35 ton derrick.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Space is available.

## **HABITABILITY**

Fresh water evaporation plant, refrigeration plant and air-conditioning.

## OTHER FEATURES

Helicopter deck-aft of the superstructure. Vessel may be navigated from the crow's nest.

## TYPE OF OBSERVATIONS

No information, but presumably could be equipped to perform any kind of oceanographic observation.

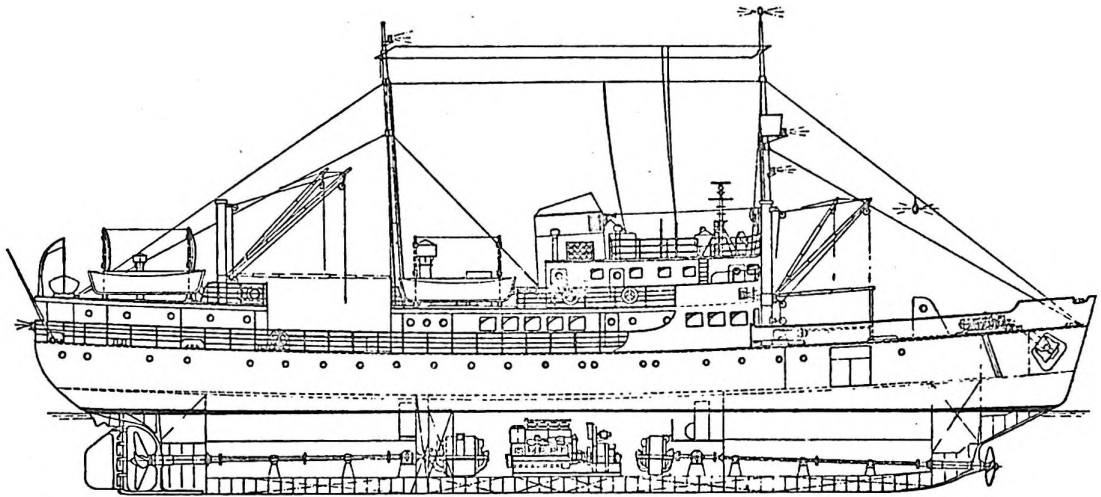
## REMARKS

Fire fighting equipment and lifeboats are fitted in accordance with international regulations.

# FINLAND

## SECTION 20

# ARANDA



**TYPE:** Passenger Icebreaker and Research Ship, twin masts each equipped with loading booms. Steel hull with specially strengthened stem and waterline.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1953	173'2"	34'4"	14'	1,100 tons (full)	847.2	286.3

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
10	11.6		3,300 miles	18 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
27	varies to 22



## **AFFILIATION**

In winter serves as a passenger icebreaker owned by the Board of Navigation. In summer is operated by Institute of Marine Research as a research vessel.

## **PROPULSION**

Diesel-electric engines, total shaft power 1,200 HP, twin screw, fixed-blades, one in stern and one in stem. Speed of both shafts may be set individually on bridge. Uses Diesel Medium.

## **ELECTRICAL POWER**

Has two 115 KW, 230V DC generators; part of this service required by ship. Also 7.5 KVA, 50-cycle, of which ship uses 2.5 KVA maximum. Car batteries for portable equipment also available.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Decca, loran, radar (Kelvin-Hughes 2C), gyrocompass (Brown), magnetic compass, electrical log (Walkers Cherub III), and radio direction finder (Helvar).

Communication - Transmitters - Valtion Sähköpaja LLH81, Star-Radio SRRT 10, and Star Emergency SRUF 1620 (VHF). Receivers - Hagenuk UE 11; Helvar RHY 101/52; and SRUF 1620. Range of transmitting frequency, 1967-3240 KC; receiving frequency, 0.1 to 20.0 MC. Crystal frequencies: 1967, 2002, 2182, 2196, 2336, 2724, and 3240 KC.

Echosounders - Kelvin-Hughes Marine (wet paper). Atlas Echograf, special double frequency with individual controls (dry paper).

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One hydrographic winch, K-1534 Volmet with 4,000' of 4 mm. wire. One hand winch with over 100 m. of wire. Two electrical Thomas Thrige cargo boom winches with 500 m. of 16 mm. wire each. One Thomas Thrige electric anchor winch with 630' of 1-3/8" cable.

## **ACOUSTICAL CHARACTERISTICS**

Ship is very noisy. Ship may become "quiet" in extreme emergencies for few minutes.

## **LABORATORIES**

Wet laboratory accommodates six, has AC and DC current, hot and cold fresh and salt water, gas container, and vacuum pump. Geology laboratory has running water, gas container, and AC and DC current. Biology laboratory has running fresh and salt water and AC and DC current. Dark-room has running water and large refrigerator. Electronics laboratory has AC and DC current.

## **HABITABILITY**

Excellent for Arctic waters. In tropics, minor modifications may be necessary. Ship carries 90 cu. m. fresh water; no distillation apparatus.

## **OTHER FEATURES**

With stem and stern propellers ship can move at any desired slow speed and may even move sideways. Will manage about 0.5 m. of fast-ice or more. Has rolling keels. Satisfactory observations have been made at wind speeds up to 14 m./sec.

## **TYPE OF OBSERVATIONS**

Has facilities for hydrographic casts, BT's, current observations (GEK, Witting, Jelly bottles, drift buoys), coring, plankton tows, sediment layer and fish echosoundings, firing and timing seismic work, and transparency studies.

## **REMARKS**

Vessel not available for oceanographic research when passenger service required. Women scientists could be accommodated. Name in Finnish means (she) who plows (the sea).

# FRANCE

## SECTION 21

# F. N. R. S. III

NO PHOTO AVAILABLE

TYPE: Bathyscaphe (Research Submarine)

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1953				11.25 tons (in air) 6 tons (in water)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
			12,000' (depth)	several hours

## COMPLEMENT

CREW	SCIENTIFIC STAFF
1	3

## **AFFILIATION**

Jointly owned and operated by the French Navy and the Belgian National Foundation for Scientific Research (F.N.R.S.).

## **PROPULSION**

Has two propulsion motors for horizontal movement. Vertical movement controlled by ballast corrections.

## **ELECTRICAL POWER**

No specific information, but sufficient power available to operate the propulsion motors, six 1,000W search lights, electronic flash equipment, depth sounder, and numerous other instruments.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Has compass, radio-telephone, ultrasonic equipment, and depth sounder.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Not applicable.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

None as such. Many instruments and gauges are dispersed throughout the vessel.

## **HABITABILITY**

Dives are performed over a period of several hours.

## **OTHER FEATURES**

Electromagnetic safety controls allow for the ballast to be released if electrical breakdown occurs. Nothing worse than premature return to the surface results from electrical breakdown.

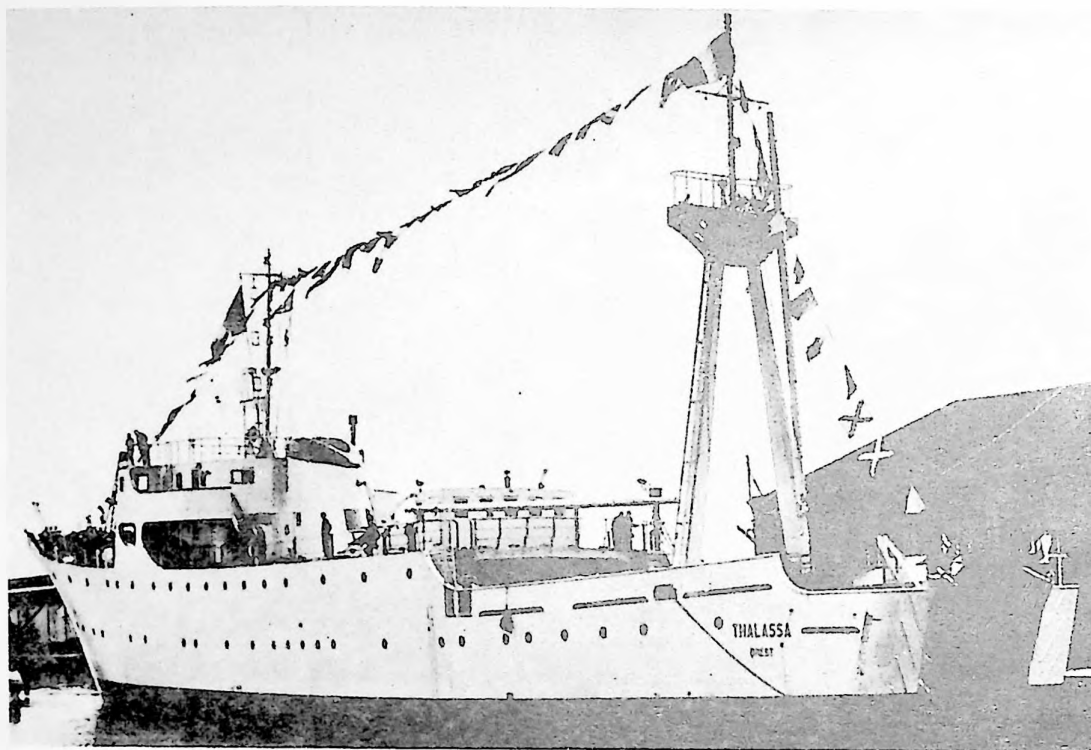
### TYPE OF OBSERVATIONS

Continuous recording of sea temperature, underwater and bottom photography, biological studies, and water samples.

### REMARKS

Besides above mentioned equipment vessel has: air purifying apparatus, gauges which show quantity of iron shot in hoppers, gauges of gasoline and water level, detectors of water leaks, pressure gauges indicating depths, and temperature gauges for gasoline and sea water. Newer vessels of this type were under construction and this vessel may now be replaced by one of these.

# THALASSA



**TYPE:** Fishing Research Ship, derrick mast aft, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1960	216.8'	34.1'	14.3'		1,481	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
9	12	1.5	12,900 miles	60 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
32	22

## **AFFILIATION**

French Merchant Marine.

## **PROPULSION**

Direct diesel, controllable pitch screws. Two Duvant engines of different size are installed: one 800 HP and one 300 HP. These can be used in tandem or separately. They are connected to shaft through hydraulic clutch.

## **ELECTRICAL POWER**

Ship's service power is 380V, 50-cycle, current supplied by two 150 KVA generators. These two sets can be operated in parallel if required. One 40 KVA generator available for in-port use. Current available is 110V AC. No constant frequency current available.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Goniometric radio, Decca 9-channel navigator, and Decca 45-mile radar.

Communication - One Groci goniometric radio, one Phonic sender and receiver (8 dupliphone frequencies), two all wave receivers, two graphic sending sets 1-OC and 1-OM, and one Phonic sending set OC.

Echosounders - Kelvin-Hughes MS26K (9,000 m.), Pinquin receiving periphone fishing asdic having range of 4,000 m. horizontally (convertible to vertical sounder), Scam 619 fishing, Sadir Carpentier S with fish viewer, and Hydro Atlas Werke Tiefseelat (8,000 m.).

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Two hydrographic windlasses, one with 500 m. of 4 mm. wire and other with 1,640 m. of 4 mm. wire. Also has hoist with 200 m. of docking cable, and trawl winch with 2,000 m. of 10.5 mm. wire. Has Galeazzi windlass turret for Galeazzi turret lowering.

## **ACOUSTICAL CHARACTERISTICS**

No information.



## LABORATORIES

Two chemical laboratories (25 sq. m. total area), biological laboratory (21 sq. m.), room for storing and analysis (17 sq. m.), technical laboratory (40 sq. m.), and a hydrology laboratory (18 sq. m.). All have electricity and running water.

## HABITABILITY

No information, but presumably capable of operations in all ice-free waters.

## OTHER FEATURES

Galeazzi tower for underwater observations up to 6,000 m. Has Pleuger active rudder ensuring great maneuverability at low speed. Active rudder assembly consists of electric motor located in rudder blade and driving auxiliary propeller of 650 mm. diameter with power of 75 HP at 720 r.p.m. Steering control may be exercised from pilot house, after conning station, or manually. Rudder has a normal maximum swing of 35°, but can swing up to 80° when using active rudder. Maximum setting controlled by a remote in pilot house. Has bilge keels to reduce rolling.

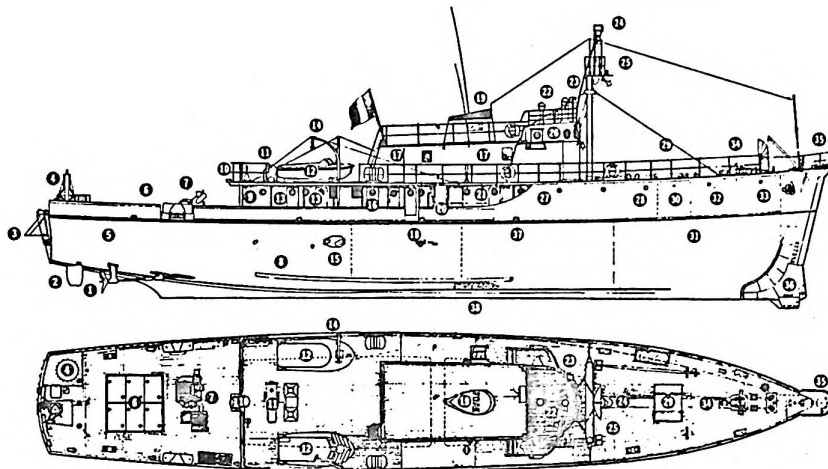
## TYPE OF OBSERVATIONS

Dredging, coring, hydrographic casts, current measuring, and chemical analysis.

## REMARKS

Primarily designed for fisheries research but also an excellent vessel for hydrographic and oceanographic survey and research.

# CALYPSO



*Calypso*  
NAVIRE Océanographique  
du Commandant COUSTEAU

## NUMERICAL KEY TO CALYPSO FEATURES

- 1 TWIN SCREWS
- 2 TWIN RUDDERS
- 3 DRAWBRIDGE DIVING PLATFORM
- 4 YUNBO HYDRAULIC CRANE
- 5 AFTERHOLD
- 6 MAIN HATCH
- 7 OCEANOGRAPHIC WINCHES
- 8 ENGINE ROOM
- 9 DIVER'S ROOM AND SHOP
- 10 WINCHMASTER'S PULPIT
- 11 DECOMPRESSION CHAMBER
- 12 METAL LAUNCHES
- 13 TWO-MAN CABINS SENIOR MEMBERS OF CREW & SCIENTISTS

- 14 DAVITS
- 15 ENGINE EXHAUST VENTS
- 16 SALON
- 17 LABORATORY ELECTRONICS AND CHARTROOM
- 18 GALLEY
- 19 DUMMY FUNNEL-STOBEROOM
- 20 TRANSVERSE ALLEYWAY
- 21 COUSTEAU'S QUARTERS
- 22 COMPASS Binnacle AND CYRO-REPEATER
- 23 SEARCHLIGHT
- 24 RADAR ANTENNA
- 25 HIGH OBSERVATION BRIDGE
- 26 BRIDGE

- 27 TWO-MAN CABINS
- 28 LAB
- 29 FORWARD WATCH
- 30 PASSAGE AND LADDER TO FORECASTLE
- 31 FORECASTLE-INDIVIDUAL CABINS FOR EACH CREW MEMBER
- 32 WASHROOM AND LAUNDRY
- 33 PAINT LOCKER
- 34 ANCHOR WINCH
- 35 HATCH TO UNDERWATER OBSERVATION CHAMBER
- 36 UNDERWATER OBSERVATION CHAMBER
- 37 PHOTO LAB, MACHINE AND CARPENTRY SHOPS
- 38 SONAR TRANSDUCERS

TYPE: Former YMS-Class minesweeper of the Royal Navy, wood hull.  
Now an under-sea research vessel.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1942	141'	23'		360 tons		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
			5,000 miles	

## COMPLEMENT

CREW	SCIENTIFIC STAFF
12	10

## **AFFILIATION**

Sponsored by the French Ministry of National Education and the National Geographic Society.

## **PROPULSION**

Powered by two 600 HP General Motors diesels turning twin screws. Twin rudders.

## **ELECTRICAL POWER**

Equipped with exceptionally powerful sources of the two kinds of auxiliary energy required for her various disciplines, and numerous electric generators for her profuse electronic devices and undersea lighting systems.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Radar, sonar, gyrocompass, automatic pilot, magnetic compass, and remote controls for the engines.

Communication - Radios, internal telephones, radiotelephone, and intercom.

Echosounders - EDO UNQ depth recorder with variety of transducers and recorders.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

A classic small winch handles the BT's. Universal twin-jointed hydraulic Yumbo crane, and several oceanographic winches.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Fixed temperature photographic laboratory capable of processing 35-mm. stills and movies at sea. Afterdeck room for diver's ready room and laboratory. Machine and carpentry shop. Air compressors.

## **HABITABILITY**

No information.

## **OTHER FEATURES**

Submerged observation chamber on the forefoot. A midships well by which divers can plunge through the ship's bottom, and stern draw-bridge diving platform. High observation bridge. Underwater television equipment. Free-moving jet-propelled Diving Saucer which has been tested down to 1,000 ft.

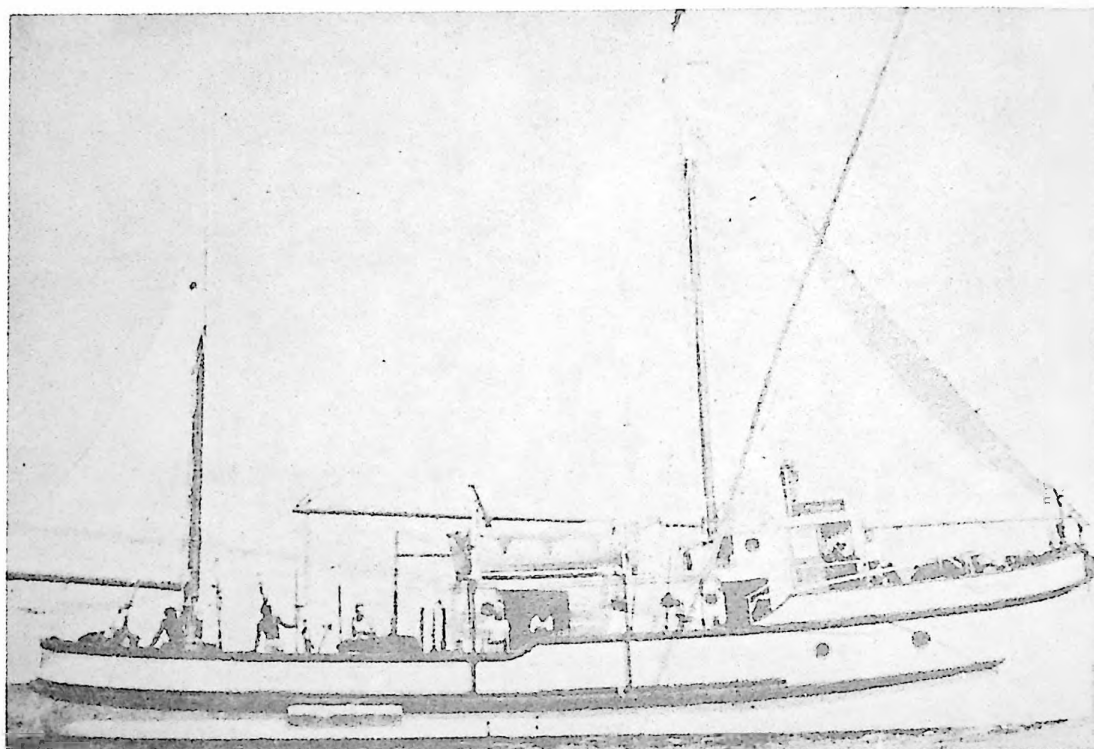
## **TYPE OF OBSERVATIONS**

Standard oceanographic observations as Nansen casts, bottom samples, currents, wave and swell recordings. Probably the best equipped vessel for underwater photography and television in the world.

## **REMARKS**

Generally carries a professional free-diving team with advanced underwater movie, still, and television cameras. Group pioneered in techniques of very deep electronic-flash photography. Carries two unsinkable light aluminum launches powered by Evinrude outboards.

# L'ORSOM III



**TYPE:** Ketch, wood hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1947	73.8'	19.2'	9.6'			

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
6			2,500 miles	10-15 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
12	5

## **AFFILIATION**

Institut Francais D'oceanie, Noumea, New Caledonia.

## **PROPULSION**

Caterpillar Diesel, 135 HP, with single fixed-blade propeller.  
Carries 22 tons of fuel oil. Has sails for auxiliary use.

## **ELECTRICAL POWER**

Has 110V AC from two 12 HP Guldner generators.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - No information.

Communication - AWA radio, 5W.

Echosounders - Kelvin Hughes King Fish, 240 fms.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has a mechanical hydrographic winch with 6,500 ft. of wire and a long line hauler.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Has 172 sq. ft. of laboratory space on deck.

## **HABITABILITY**

Carries 10 tons of fresh water.

## **OTHER FEATURES**

None.

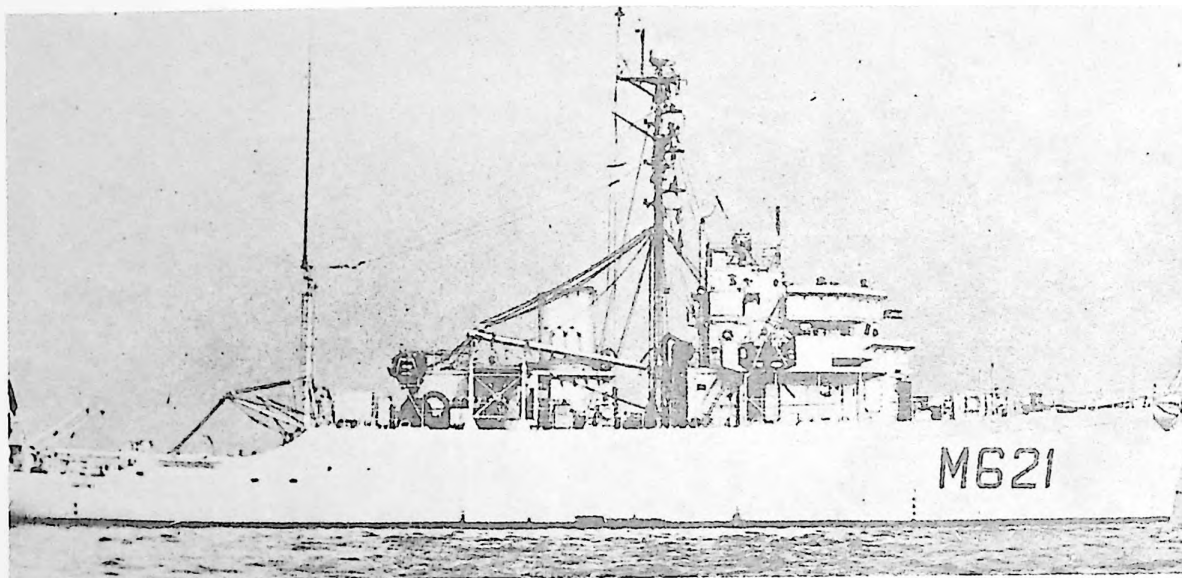
## **TYPE OF OBSERVATIONS**

BT, water sampling, plankton hauls, exploratory fishing, experimental fishing to improve gear efficiency.

## **REMARKS**

Refitted in 1955. Generally performs well but low speed is a disadvantage. Works mainly in the Coral Sea.

# ORIGNY



**TYPE:** Ocean Minesweeper, (ex-AM 501).

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1956	172.5'	35'	10.4'		800	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
13.5	11		3,000 miles	10 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
51	5

## **AFFILIATION**

Service Central Hydrographique, 13 Rue De L'Universite, Paris.

## **PROPULSION**

Has two General Motors diesel powered main engines, 800 HP at 240 r.p.m. each with two controllable-pitch propellers. Fuel tank capacity 51.72 tons.

## **ELECTRICAL POWER**

Has 250 KW AC, 60 KW AC, 25 KW DC and 125 KW AC from various generators. Has 220/110V AC and 110V DC available.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass, SO 8 radar 80 mi. range, Goniometre loran.

Communication - TBL 7 radio, A 200W, A2 100W, A2 50W.

Echosounders - ANQU/1/3 36,000 ft. range, asdic QCU2 24 KC 19,700 ft. range, also carries two hydrophones.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has 3 Mecaboiler electric winches, two 10 HP with 2,600m. and one with 4,000 m. of cable. One 10 HP Bergen DC winch with 5,000 m. of cable and two electric AC winches, one 45 HP with 4,000 m. and one 3 HP with 340 m. of cable.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Has 549 sq. ft. of laboratory space above, on, and below the main deck.

## **HABITABILITY**

Fresh water capacity 18.52 tons, has 7 1/2 ton/day evaporator.



## OTHER FEATURES

None

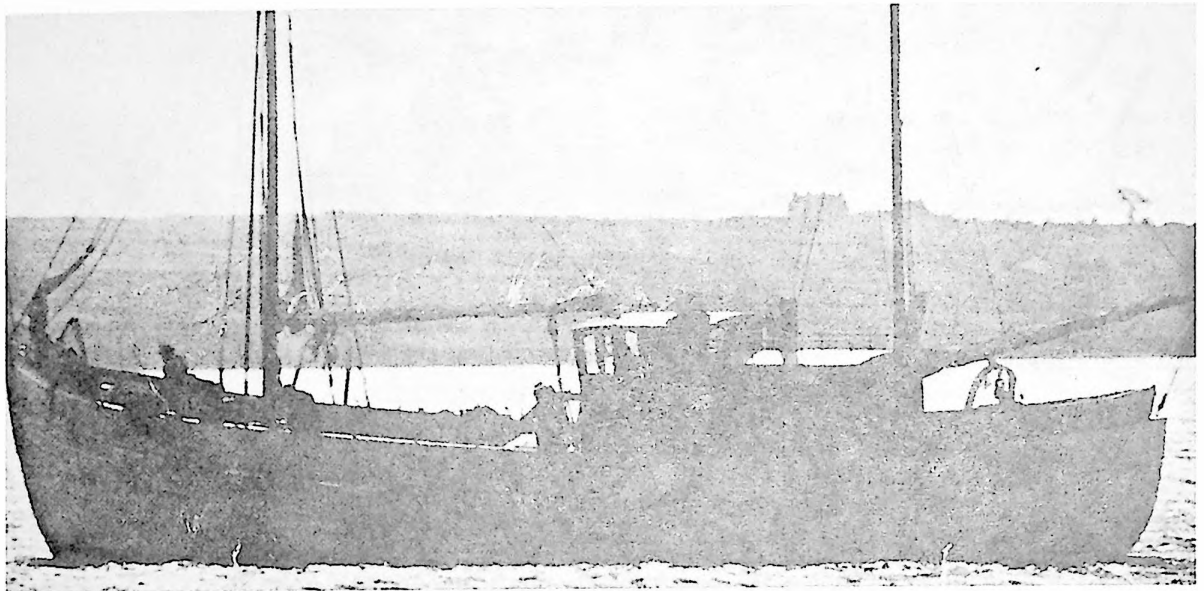
## TYPE OF OBSERVATIONS

Hydrographic casts, BT, currents, bottom samples, plankton hauls and meteorological observations.

## REMARKS

Capable of performing basic oceanographic observations, but rolls badly in heavy seas. Generally works in the western Mediterranean.

## PLUTEUS II



TYPE: Fishing Boat, wood hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1953	62.4'	17.9'	6.7'	75 tons		

### PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
	9		200 miles	4 days

### COMPLEMENT

CREW	SCIENTIFIC STAFF
6	14 (mostly students)

## **AFFILIATION**

Station Biologique de ROSCOFF (Finistère).

## **PROPULSION**

Diesel Baudouin DNK 6-1/4 HP, with fixed pitch propeller. Carries 3,500 liters of fuel oil.

## **ELECTRICAL POWER**

Has 24V dynamo 1,500W and a 1,200W dynamo, and other auxiliary machinery.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Mark V Decca navigator.

Communication - Radio Ocean 20W.

Echosounders - Kelvin Hughes, 0-180 m.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

No information.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Has 4 sq. m. above deck and 10 sq. m. below deck.

## **HABITABILITY**

Carries 1,500 liters of fresh water.

## **OTHER FEATURES**

Has anti-rolling equipment.

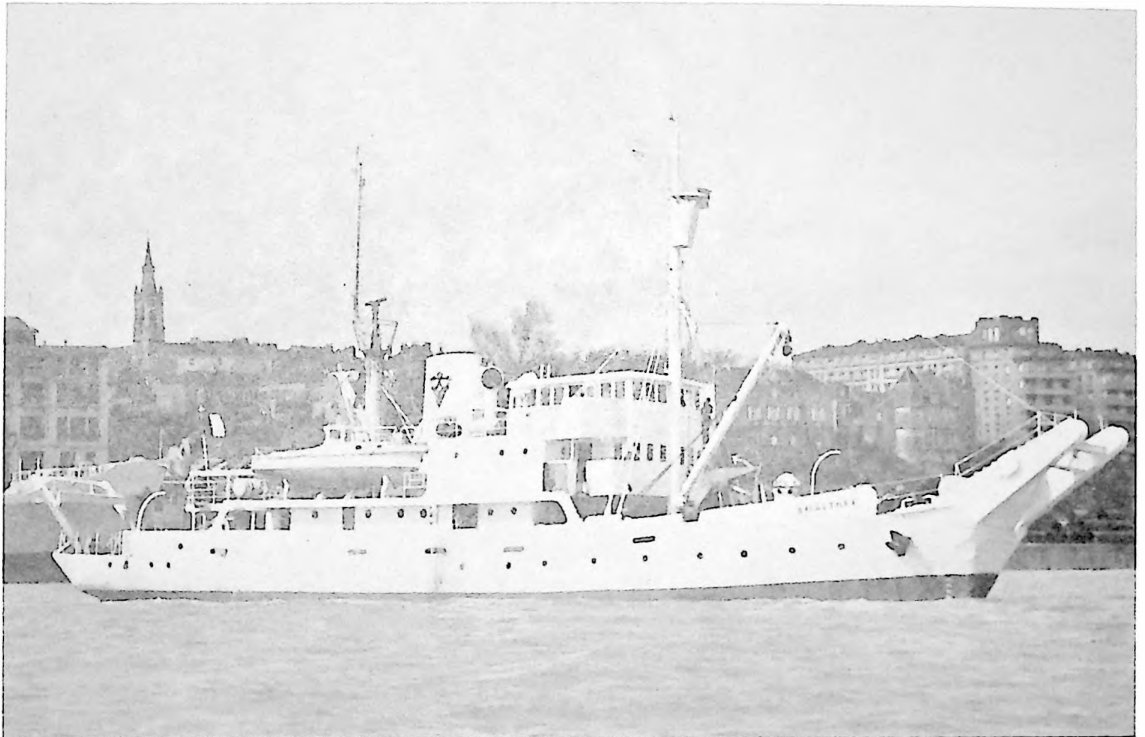
## **TYPE OF OBSERVATIONS**

Dredging, plankton hauls, currents and meteorological observations.

## **REMARKS**

Generally works in the English Channel.

# AMALTHEE



TYPE: Originally blocking boat (AN), steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1961-1962 (refitted)	154'	31'	16'9"	850 tons (full load)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
9	11	1		12 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
30	13

## **AFFILIATION**

Sahara's Natural Gas Transport and Valorization Study Society (SEGANS),  
7 Rue Nèlaton PARIS 15°.

## **PROPULSION**

One reciprocating steam-engine, 850 HP single screw and one bow trans-versal propeller, 100 HP. Carries 150 tons fuel oil, uses about 8.5 tons/day.

## **ELECTRICAL POWER**

Two 50 KW motor generators, one 150 KW motor generator, and one 20 KW steam driven generator. Normal operation of ship requires 70 KW. Available for scientific apparatus and instruments, 200 KW. Has 270 KW 3 phase, 220V, 50-cycles; 10 KW 3 phase, 110V, 50-cycles and continuous 110V, 200 amp.-hrs. available on alkaline accumulator.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass, ARMA-BROWN (AOIP); three networks hyperbolic magnetic compasses TORAN and KELVIN-HUGHES radar.

Communication - T/R HF phonic and graphic PNQ 16 decked 800 miles VHF short distance with hydrographic annexer.

Echosounders - Two special immersed sounders are available to give greater precision recording where necessary, and to pinpoint objects on the sea bed or in the vicinity of the sea bed. SEGANS has installed on the AMALTHEE seismic equipment designed to analyse the sedimentary layers.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Two 25 HP hydraulic winches, capacity 2 tons with 3.12 mi. of 5/32" wire; 2 mi. of 15/64" wire and 1.24 mi. of 23/64" wire. One can work port and one works port and starboard. One special winch for taking up the slack in a 4 conductor electric cable. Two independent drums capable of 0.93 mi. of 19/32" wire; two main steam winches, 5 tons at 20 ft./sec. or 10 tons at 10 ft./sec. One hydraulic crane YUMBO, 4 tons capacity. One lifting frame operated by hydraulic jack for handling towed apparatus, 4.5 tons capacity.

## **ACOUSTICAL CHARACTERISTICS**

None

## LABORATORIES

Hydrographic, sedimentation and photographic laboratories.

## HABITABILITY

Air-conditioned. Can work tropical as well as polar areas. Carries 50 tons of drinking and washing water with daily consumption averaging 2.3 tons.

## OTHER FEATURES

Two antirolling keels.

## TYPE OF OBSERVATIONS

Soundings down to 7.5 mi., submarine seismic work, submarine stereo-photos down to 1.3 mi., direct observation of the bottom by Galeazzi Tourelle down to 0.4 mi., submarine television down to 0.62 mi., hydrology, sedimentology, dredging, and coring.

## REMARKS

None



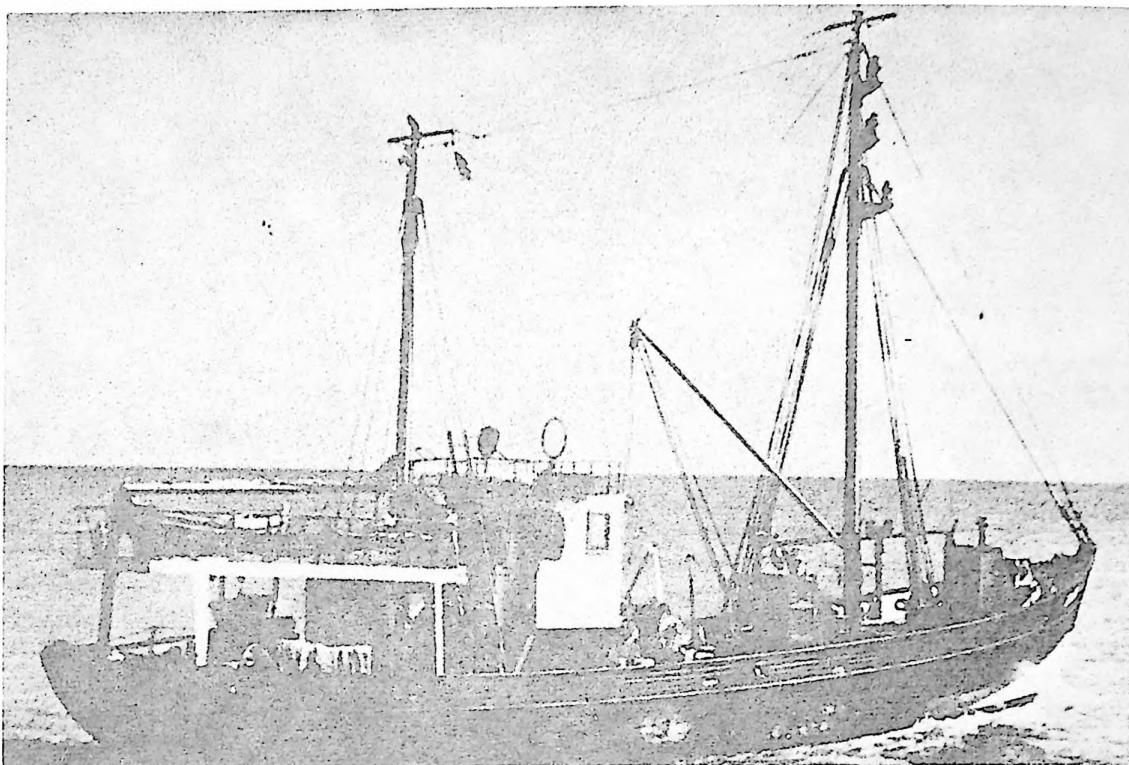


FEDERAL REPUBLIC OF GERMANY

SECTION 22



# "UTHORN



TYPE: Research Cutter.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1942	24.5 m.	6.4 m.	2.7 m.	68.7 tons		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
8	9		180 miles	6-30 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
4	8

## **AFFILIATION**

Helgoland Biological Station. Hamburg, Germany.

## **PROPULSION**

Diesel motor, 150 HP. Carries 5.4 tons of fuel oil.

## **ELECTRICAL POWER**

Has 220V AC, 12.5 KVA, 50-cycle, and 24V DC.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Directional radio (FKP 52 Plath/Hagenuk).

Communication - FTW SqE 543e transmitter and receiver. Transmits on 1665, 2023, 2153, 2182, and 2386 KC and receives on 2421 KC.

Echosounders - Atlas 50, range 100 m. and Atlas Monograph 58, range 3,000 m.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has a mechanical hydrographic winch with 120 m. of cable and a trawl winch with 220 m. of cable. Also has net winch with 100 m. of 12 mm. wire, and anchoring winch with 40 m. of 12 mm. wire.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Has two laboratories (8 sq. m. each) for biological and hydrographical investigations.

## **HABITABILITY**

Carries one ton of fresh water.

## **OTHER FEATURES**

Has a Trübungsmesser (Turbidity meter), and refrigerator.

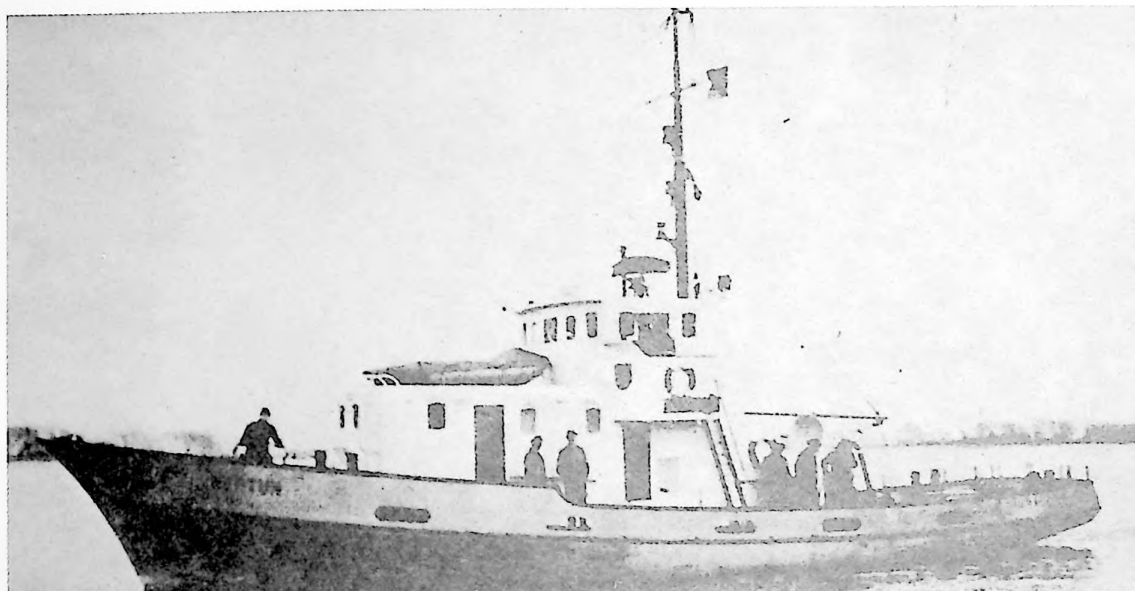
## TYPE OF OBSERVATIONS

Water sampling, bottom grabs, dredging, plankton hauls, turbidity measurements, biological observations, exploratory fishing, and hydrographic survey.

## REMARKS

Generally works in the southern part of the North Sea.

# NEPTUN



**TYPE:** Steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1961	77'	20'	6.9'			

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
8	11		100 miles	8 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
5-6	4-5

## **AFFILIATION**

Staatliches Fischereiamt, Bremerhaven.

## **PROPULSION**

Air cooled diesel, Deutz Sba 12 L 715, 240 HP, with single fixed-blade propeller. Carries 10 tons of fuel oil.

## **ELECTRICAL POWER**

Has a 25 HP generator producing 220V DC.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Decca radar D303, 3/4 to 36 miles.

Communication - Telefunken radio SE 535/3.

Echosounders - Elac and LAZ 17, range to 790 ft. Also has asdic (Fischlupe Elac and LAZ 16).

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Two mechanical hydrographic winches with 330 ft. cable, two coring winches, one trawl winch with 1,300 ft. cable, two line haulers, and two net haulers.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Total space on and above deck 473.61 sq. ft.

## **HABITABILITY**

Carries 2 tons of fresh water.

### OTHER FEATURES

Has antirolling equipment.

### TYPE OF OBSERVATIONS

Oceanographic and biological observations, fisheries research and hydrographic survey.

### REMARKS

Generally works around Helgoland.

# ANTON DOHRN



**TYPE:** Research Trawler, steel.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1955	62.3 m.	10.3 m	5.5 m.	1,325 tons	999	365

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
11	11.5	3.5		60 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
29	17

## **AFFILIATION**

Commissioned by the German Scientific Commission for Oceanic Research.

## **PROPULSION**

Hot steam engine, triple expansion, with steam turbine and oil fired water-pipe-boiler, 600 HP. Single fixed-blade screw ; active rudder (Pleuger, 100 HP). Uses Marine fuel oil, capacity 272 cu. m.; also carries Gas oil, 29.7 cu. m.

## **ELECTRICAL POWER**

Ship generates 180 KW, requires 75 KW for normal ship operations, about 100 KW available for scientific work. Current on board: 220V DC, 180 KW. Converter: 18 KW, 220V AC. Three-phase, 50-cylce, 380/220V is taken from 125 KVA rotary current for active rudder. Has 24V for accumulator.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation- Ausschütz gyrocompass with automatic control, Plath reflection magnetic compass, log, Decca radar 45, Decca radar 404, Atlas echosounder (Duo-type), Behm echosounder with recorder (Fahrentholz), EDO-loran (type 262), Decca navigator with plotter, and Plath visual direction finder for critical frequency.

Communication - Radio station equipped with LF, HF, and MF and emergency transmitter for radio communication and radio-telephone. Information given on board by intercom commanding system and telephone plants.

Echosounders - One deep-sea sounder (Fahrentholz), one horizontal sounder, one Atlas sounder (Fishfinder), and one Atlas echosounder used to determine net depth.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has one fishing net winch, (mfg. M. Achgelis-Söhne), two drums, with 1,400 fms. of 2-7/8" trawl warp, steam engine, 260 HP. One cutter winch, oil hydraulic power, 40 HP (mfg. Mützelfeldtwerft), has two drums for 500 fms. trawl warp each and third drum for 6,000 m. of 8 mm. wire. Two oceanographic winches, 10 HP electric motor, with 6,000 m. of 4 mm. wire (mfg. Mützelfeldtwerft). One of these winches has sliding contact and can be used for making observations requiring electricity. Has one 5 HP BT winch (mfg. Mützelfeldtwerft) with 1,000 m. of 3 mm. wire. Has net winch (Atlas-Werke) with 1,000 m. of 10 mm. wire for pelagic fishing.



## ACOUSTICAL CHARACTERISTICS

Nearly noiseless, but cannot be made completely noiseless.

## LABORATORIES

Many laboratories, non air-conditioned, have 220V DC and 220V AC. Oceanographic recording room also has 24V outlet. Laboratories are: fish laboratory (3.2 x 3.4 m.), bacteriological laboratory (3.3 x 2.5 m.), laboratory for fishing gear (3.2 x 2.4 m.), biological laboratory (4.2 x 2.7 m.), oceanographic recording room (2.6 x 2.3 m.), oceanographic well (radius 0.6 m.), room for taking water temperatures (2.9 x 1.1 m.), oceanographic laboratory (3.2 x 3.0 m.), and sounding room (3.3 x 2.3 m.). All laboratories well equipped to perform their specific duties.

## HABITABILITY

Ship can work in tropics as well as near poles. Hull strengthened for ice navigation. Quarters are comfortable. Carries 189 tons of usable fresh water (limiting endurance factor); no distillation apparatus; no salt water showers.

## OTHER FEATURES

Has several deep freeze rooms. Built-in active rudder, 100 HP, makes it possible for ship to hold exact position or maneuver well during measurements at sea. With oceanographic well, water turbidity measurements using D-instrument, and salinity observations are made. Also has hospital with surgery, X-ray room, dental station, and medical laboratory. Has two purse seine boats (length 9 m., beam 2.9 m.) driven by 25 HP diesel motors. Meteorological station equipped with complete set of all kinds of wireless receivers, tele-printers, and radio-telephones, and all latest meteorological instruments. With two rolling keels ship can make observations up to wind force 10.

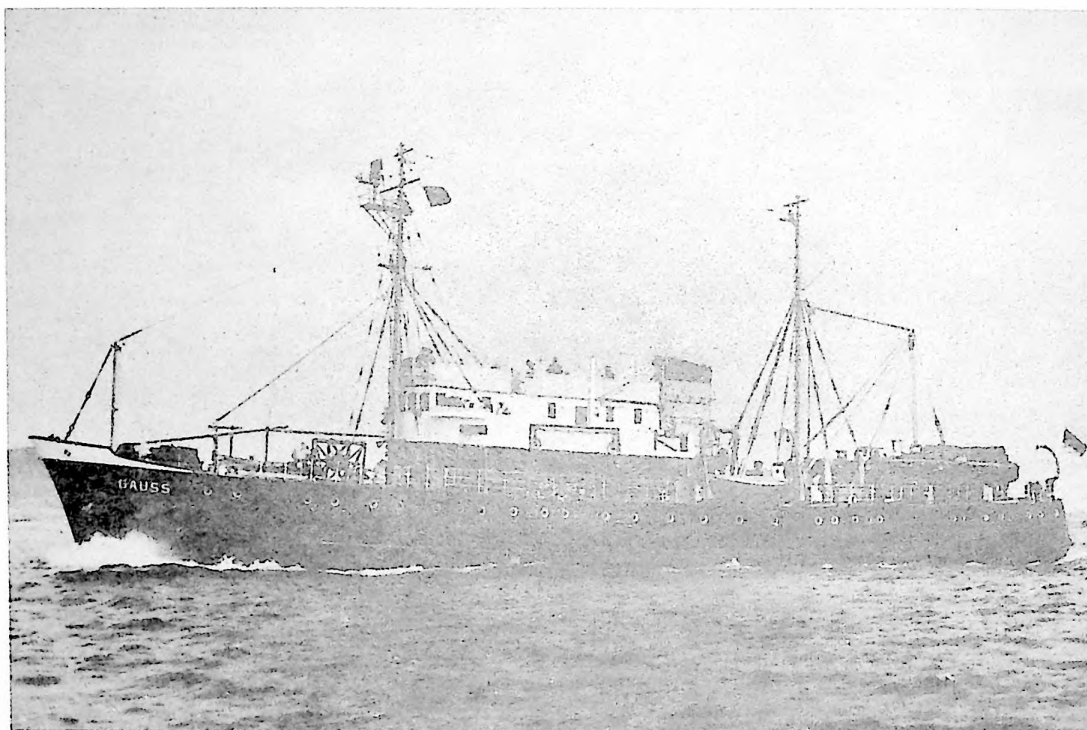
## TYPE OF OBSERVATIONS

Bottom trawl, net, pelagic and purse seine fishery, cutter fishery, and oceanographic observations. The two permanent meteorologists give weather reports, forecasts, and warnings for storm, fog, ice, and icebergs.

## REMARKS

For cruise leader, a living room and special working room available; conference room for all scientists. Female scientists can be accommodated. One of the best equipped oceanographic vessels of the world. Named after German marine biologist.

# GAUSS



**TYPE:** Twin masted, single screw, steel ship, originally built as Water Carrier.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1941	185'8"	28'10"	13'1"		845.6	223.9

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
9.5	12	3	10,000 miles	30 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
40	13

## **AFFILIATION**

Deutsches Hydrographisches Institut. Operated by the German Ministry of Transport, The German Federal Republic.

## **PROPULSION**

Sülzer Halberg diesel, Type 9TS29, 840 HP, single screw. Uses Gas oil; bunker capacity about 180 cu. m.

## **ELECTRICAL POWER**

Total electrical power 195 KW, 220V DC. Current available for scientific work: 220V DC, 220V AC, 14 KVA, and battery current from 2 to 24V.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompasses and repeaters (Anshultz), magnetic compasses, APN9 loran, Atlas 1500 radar, Mark V Decca - navigator, radio direction finder (Plath), and electric logs.

Communication - Transmitters - Telefunken SM519, CW; Lorenz S509a CW and voice; Telefunken SK526, CW and voice. Receivers - Siemens 745E 309a; Hagenuk E75, Alarm system "Debeg" Type AT 512 and Telefunken Lifeboat Station Type SE 102. Transmitting frequencies - 410-512 KC, 1600-4250 KC; 4-22 MC. Receiving frequencies - 255-525 KC, 1.5-30 MC, 100-4500 KC (continuous).

Echosounders - Elac-Type Enif, Atlas, Elac-Type LAZ 17 recorder, and Atlas Type 9AZ42 recorder. With Elac-Type, pulse duration may be regulated from 1 sec.  $10^{-3}$  to about 35 sec.  $10^{-3}$ , extended range to 7,200 m., accuracy  $\pm 0.05\%$ . With Atlas Type, ping length may be varied, extended range to 8,000 m.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Two hydraulic hydrographic winches: one with 6,000 m. of 4 mm. wire and other with 550 m. of 26 mm. electric cable. One BT winch combined with towing winch (Twin-winch) with 1,000 m. of 3.5 mm. wire and 600 m. of 7 mm. towing cable, respectively. One Siemens-Schuskert anchor winch with 350 m. of 34 mm. chain. Portable hand winches available as required.

## **ACOUSTICAL CHARACTERISTICS**

Ship cannot be kept in noiseless condition.

## LABORATORIES

Vessel has eight laboratories including one for geology, physics, chemistry, sounding, and areas that may be considered as navigational laboratories. Total laboratory space about 84 sq. m.

## HABITABILITY

Has no ventilation or air-conditioning; strengthened for ice navigation so as to comply with regulations of the German Lloyd. Cannot work in tropics; can sail in drift-ice only if ice-floes very loose and flat. Carries 180 tons of fresh water and has fresh-water producer.

## OTHER FEATURES

Equipped with center well for echosounding experiments and for transparency measurements with the D-instrument. An under-way turbidity recorder is mounted in well. Has rolling keels.

## TYPE OF OBSERVATIONS

Hydrographic casts, bottom sampling (cores and grab samples), magnetic, gravity, and seismic measurements.

## REMARKS

Ship refitted in 1949 as survey and research vessel. Two well equipped launches available for survey operations in coastal waters. These generally left ashore when operating in deep areas. Named after German mathematician Carl Friedrich Gauss.

# UTHÖRN

NO PHOTO AVAILABLE

TYPE: Research Cutter.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
	21.4 m.	6.4 m.	2.5 m.	68.7 tons		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
8	9		180 miles	

## COMPLEMENT

CREW	SCIENTIFIC STAFF
4	8

## **AFFILIATION**

Helgoland Biological Station.

## **PROPULSION**

Diesel motor, 150 HP.

## **ELECTRICAL POWER**

Has 220V AC, 12.5 KVA, 50-cycle, and 24V AC.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Directional radio (FKP 52 Plath/Hagenuk).

Communication - FTW SqE 543e transmitter and receiver. Transmits on 1665, 2023, 2153, 2182, and 2386 KC and receives on 2421 KC.

Echosounders - Atlas 50 and Atlas Monograph 58.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has net winch with 100 m. of 12 mm. wire, and anchoring winch with 40 m. of 12 mm. wire.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Has two laboratories (8 sq. m. each) for biological and hydrographical investigations.

## **HABITABILITY**

No information.

## **OTHER FEATURES**

Has a Trübungsmesser (Turbidity meter).

**TYPE OF OBSERVATIONS**

Marine biological research.

**REMARKS**

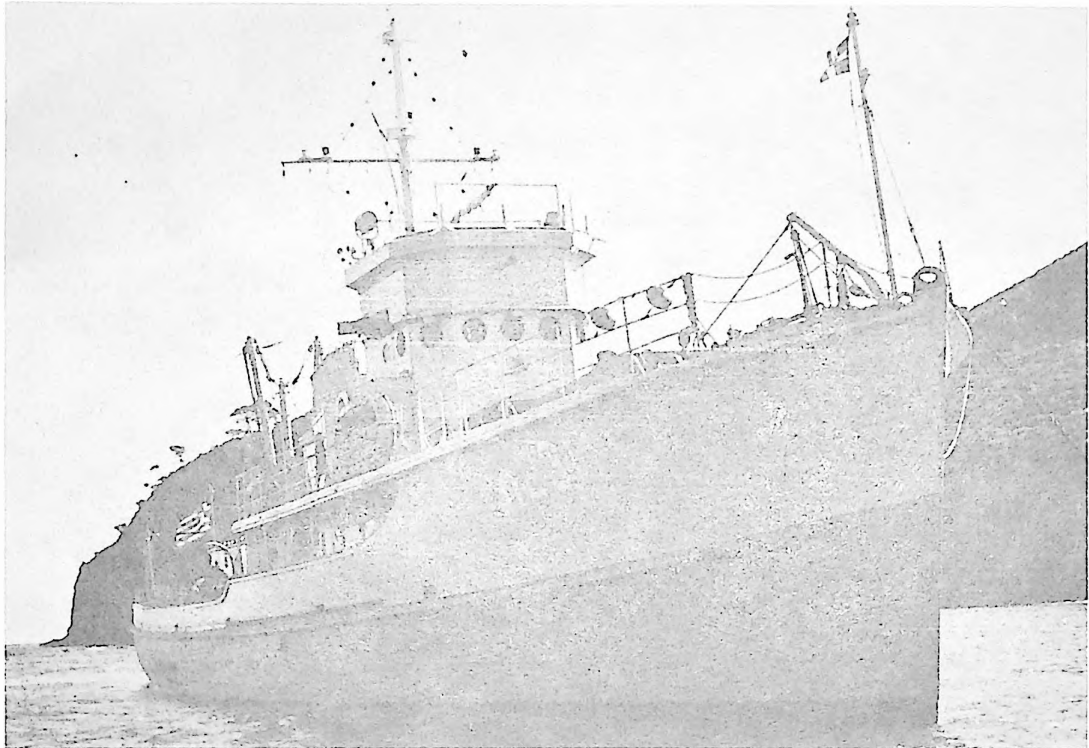
None.

# **GREECE**

## **SECTION 24**



# ARIADNI



**TYPE:** Wooden hulled, former U. S. Coastal Minesweeper (BYMS 2058).

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1942	136'	25'	6'4"	338 tons (full)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
9	14.2		3,180 miles	

## COMPLEMENT

CREW	SCIENTIFIC STAFF
31	varies

## **AFFILIATION**

Hydrographic Service, Ministry of National Defence.

## **PROPULSION**

Two GM diesels, twin screw, 1,000 BHP. Diesel oil capacity 16 tons.

## **ELECTRICAL POWER**

Constant frequency current available. Also 110V DC, 540 KW and 30 KW.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - No information.

Communication - T.C.S.-12 and SPRC, transmitting and receiving at 40W.

Echosounders - Castor LAZ 17, Atlas LA 133, and Bendix.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One Kelvin hydrographic winch with 1,200' of 3/32" wire. One Kelvin BT winch with 1,200' of 3/32" wire. One Hebezeugfabrik oceanographic winch with 20,000' of 5/32" wire. One Highliner trawl winch with 1,500' of 5/8" wire.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Has a chemical laboratory.

## **HABITABILITY**

No information.

## **OTHER FEATURES**

None.

### **TYPE OF OBSERVATIONS**

Oceanographic, hydrographic, and, to a lesser degree, fisheries research.

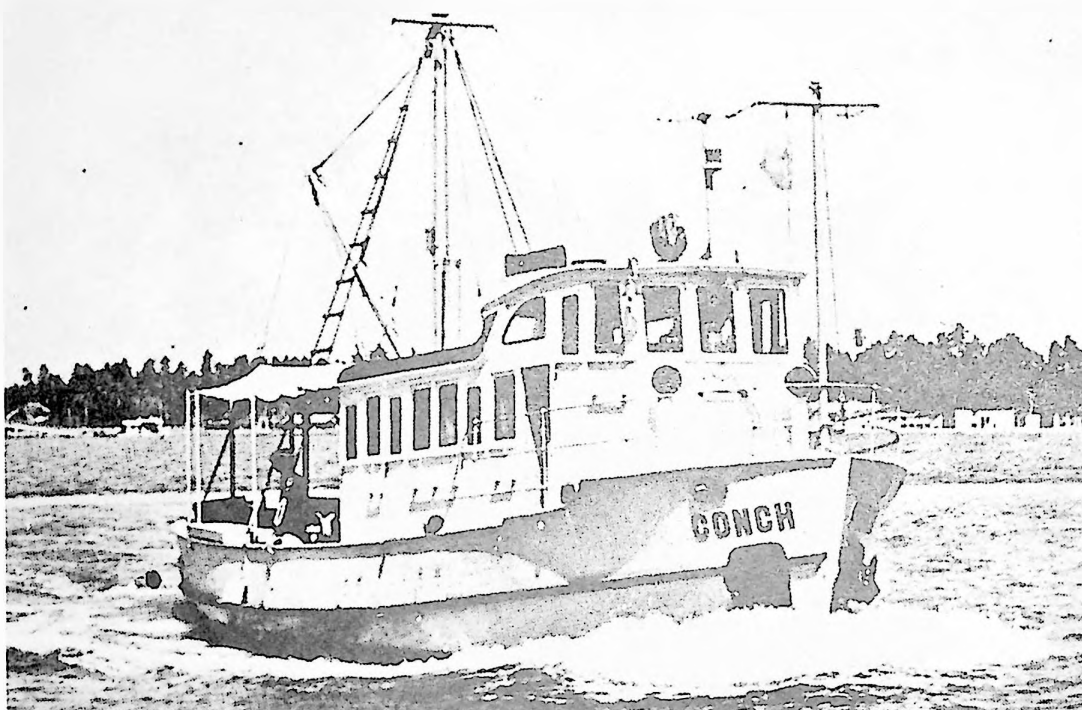
### **REMARKS**

Ship converted and commissioned as an oceanographic ship in September 1960. Replaces the Alkyoni (former oceanographic ship).

# INDIA

## SECTION 29

# CONCH



**TYPE:** Teakwood hull, single mast with one ton working load derrick.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1956	50'	15'	4'6"	32 tons	less than 40	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
8	11		400 miles	

## COMPLEMENT

CREW	SCIENTIFIC STAFF
6	7

## **AFFILIATION**

Research vessel of University of Kerala, India.

## **PROPULSION**

Two vertical four-stroke cylinder Kelvin J4 diesel engines of 44 HP each. Hydraulic winch pump coupled with one engine and salt-water bilge pump coupled with other.

## **ELECTRICAL POWER**

One diesel-driven DC generator of 1.5 KW capacity and four 12V lead accumulators located in engine room. Two of them are series connected to give 24V DC for general lighting, the electric log, and the echosounder. Remaining two are series-parallel-connected with rotary switch to feed 12V radio-telephone. Series-parallel arrangement helps recharging from the generator without reconnections and also provides 24V supply during any emergency caused by failure of other batteries.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Simrad radio-telephone (Mod. 550-4 943 with converter unit and loud speaker), Simrad echosounder (Mod. 510-3,24V), and Bergen-Nautik electric log-reader.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Hydrographic winch with 10,000' of 4 mm. wire; trawl winch (two drums) containing 1,000 m. of 9 mm. steel wire rope and 500 m. of 12 mm. steel wire rope. Both hydraulic. One ton working load derrick; hydrographic davit.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Laboratory (9' x 6'), located above deck.

## **HABITABILITY**

Fresh water capacity 200 gal. No other information.

**OTHER FEATURES**

None.

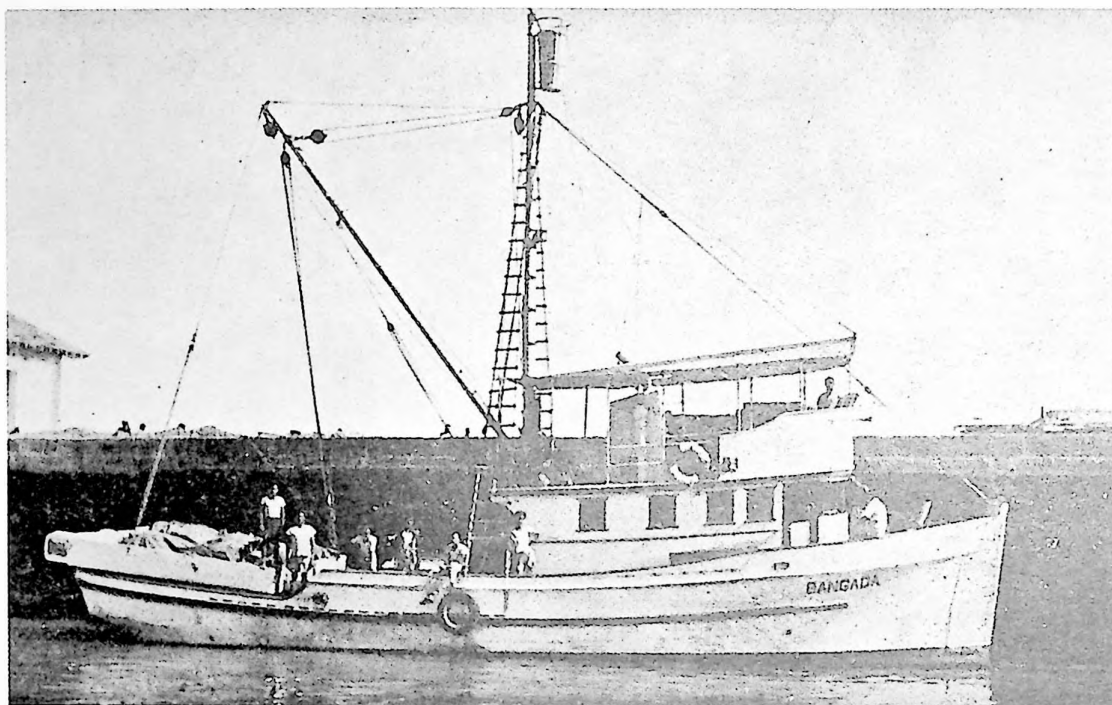
**TYPE OF OBSERVATIONS**

Oceanographic and fisheries research. Also used for training students qualifying for graduate degrees.

**REMARKS**

None.

# BANGADA



**TYPE:** Exploratory Fishing Vessel, wooden hull, build as a Purse-Seiner.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
	57'	16.8'	7'	60 tons	50	14.5

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
7	8			6 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
9 (total)	



## **AFFILIATION**

Ministry of Food and Agriculture (Department of Agriculture) New Delhi.  
Vessel attached to Off-shore Fishing Station, Cochin 5.

## **PROPULSION**

One 190 HP diesel driving a fixed propeller. Uses high speed diesel oil, carries 1,400 gal. Consumption: Idling - 2 1/2 gal./hr., Cruising - 7 gal./hr.

## **ELECTRICAL POWER**

Vessel generates 1.5 KW at 32V, all is required for normal ship operation.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Magnetic compass, ship log, radio direction finder.

Communication - Radio telephone.

Echosounder - Kelvin Hughes, range 360 fms.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Roller type trawl winch.

## **ACOUSTICAL CHARACTERISTICS**

Noiseless condition attained by stopping all machinery. Batteries would be required for electricity.

## **LABORATORIES**

None available.

## **HABITABILITY**

Tropics only. No distillation facilities; fresh water tank capacity, 1,000 gal.; consumption, about 200 gal./day. Limiting endurance factor is fresh water capacity. Women scientists cannot be housed.

### OTHER FEATURES

Four bilge keels for antirolling.

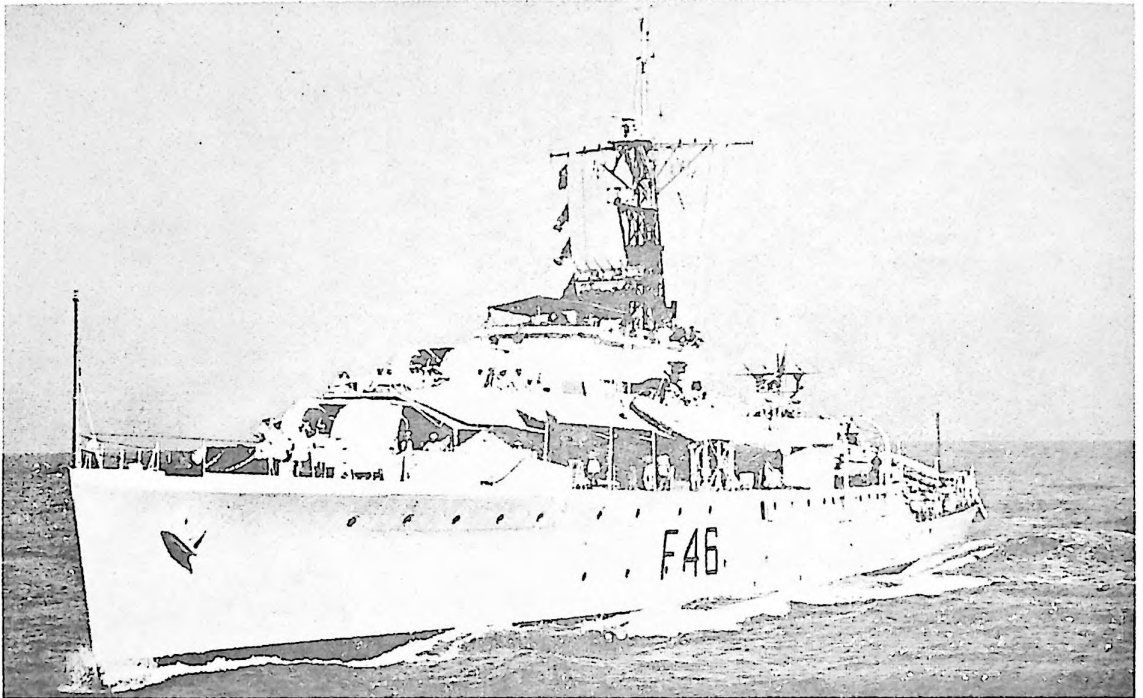
### TYPE OF OBSERVATIONS

Bottom sampling and dredging.

### REMARKS

No davit for lowering equipment. Named after Marathi name for Mackerel.

# KISTNA



TYPE: Frigate, "Kistna" Class, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1943	299 1/2'	38 1/2'	11 1/2'	1,925 tons (full) 1,470 tons (std.)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
	19		4,500 miles at 12 knots	10 days at 75%

## COMPLEMENT

CREW	SCIENTIFIC STAFF
214 (total)	

## **AFFILIATION**

Indian Navy.

## **PROPULSION**

Parson's Geared Turbine drives two fixed pitch propellers to give 19 kts. at 4,300 SHP. Uses F.F.O. and H.S.D. fuel, carries 370 tons.

## **ELECTRICAL POWER**

Sufficient AC and DC power available for the ship's services and the laboratory.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass, magnetic compass, automatic log, surface radar, M/F D.F. sonar.

Communication - World wide range of main transmitters.

Echosounder - EDO echosounder model 185, range 0 to 6,000 fms. Sounders either by a single ping or continuing automatic repetition, when coupled with PDR it will record total magnetic field, ship's heading and position.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Deep sea winch on main deck from Submarine Cables Ltd. London, wire length 30,000 ft. of 5/32" wire, speeds 0.3 to 4.0 m./sec. Hydrographic winch on quarter deck from Telcon Co. London, 30,000 ft. of 3/32" wire, speeds 0.2 to 4.0 m./sec. Both operate on 220V DC.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

One laboratory (25 x 10 ft.) for chemical, biological and physical work. Separate space for meteorological observations. Not air-conditioned. Power supply 230V 50-cycles and 220V DC.

### **HABITABILITY**

Only in tropics. Carries 100 to 110 tons of fresh water per ten days. Austere living conditions, not fit for women scientists. No salt water bath fitted.

### **OTHER FEATURES**

Not fitted with antirolling devices.

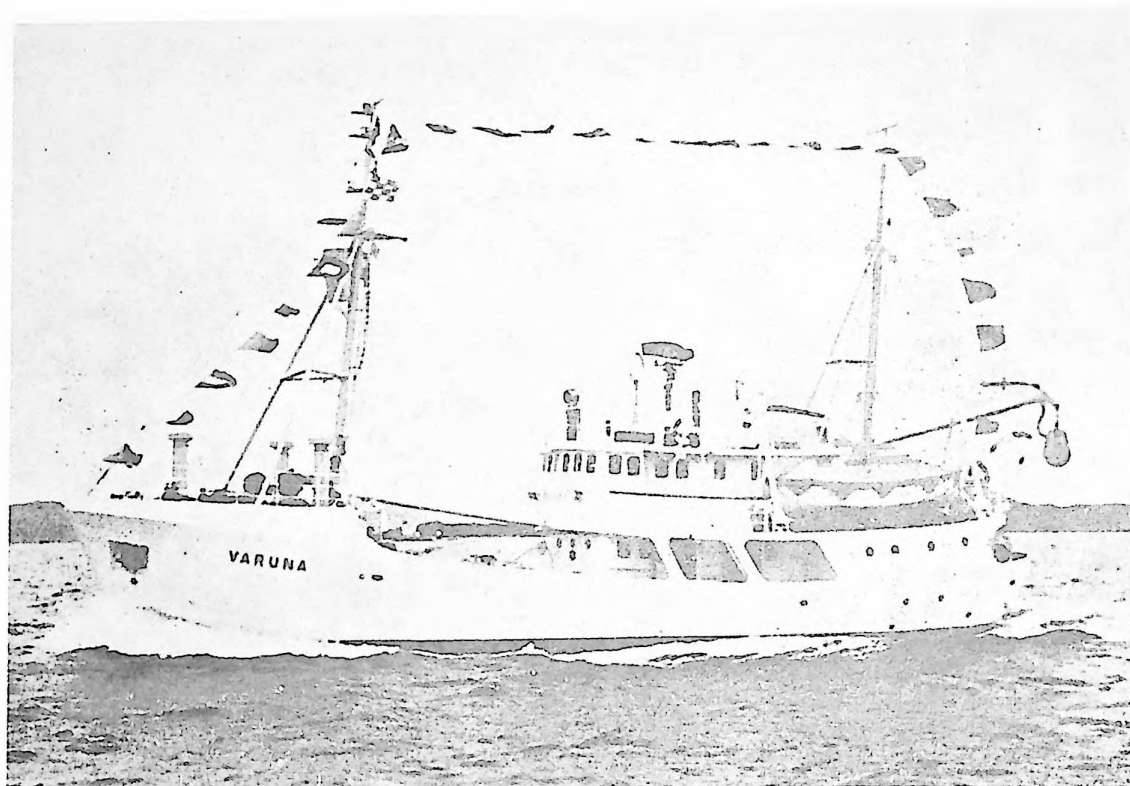
### **TYPE OF OBSERVATIONS**

BT's, currents, water sampling, bottom sampling, meteorological observations, and geophysical measurements like gravity, magnetic, bottom topography and seismic work.

### **REMARKS**

Named after Kistna River.

# VARUNA



**TYPE:** Originally designed and built as Fishing-Cum-Research Vessel,  
steel shell-plates 9 mm. thick.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1961	91.8'	22'	11'1" (aft) 8'10" (head)		160	50

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
9.3	10	0.2		30 days approximately

## COMPLEMENT

CREW	SCIENTIFIC STAFF
13	4

## **AFFILIATION**

Central Marine Fisheries Research Institute, Mandapam Camp. Used during Indo-Norwegian Project, Mahatma Gandhi Road, Ernakulam.

## **PROPULSION**

Diesel engine drives one controllable pitch propeller (Liaison type) delivers 400 HP. Diesel oil, 35 tons bunker.

## **ELECTRICAL POWER**

Ship generates 40 KW, requires about 10 KW for normal operations, has about 20 KW available for scientific gear. Has 220V AC 50-cycles. Does not have DC supply.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Magnetic compass, electric ship log, Decca radar and radio direction finder.

Communication - Radio telephone, A/S Elektrisk Bureau, Type 15-55-100, 100W 12 frequencies.

Echosounder - Three echosounders; all Simrad made in Norway with ranges of 100 fms., 1,250 m., and about 12,000 m. One asdic, range 1,500 m. Ping changeable on all instruments.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Two hydraulic winches containing 2,000 m. and 4,000 m. of wire, manufactured by Bnatvaag A/S, Norway.

## **ACOUSTICAL CHARACTERISTICS**

Can be put in noiseless condition for about 1 day, according to what is kept in deep freezer.

## **LABORATORIES**

Three laboratories, two analytic and one for reversing water bottles. Electrical energy, rain water gauges, sea surface thermograph.

## HABITABILITY

Prepared for the tropics only. Two cabins with two beds each for scientists. Women cannot be housed. Fresh water shower only. Carries 35.6 metric tons fresh water, distillation capacity is 1 ton/day (at full speed).

## OTHER FEATURES

Built to highest standards of the Norwegian VERITAS. One puretic power block and one long line self winder. Antirolling keels allow observations to Beaufort 7 or 8.

## TYPE OF OBSERVATIONS

Hydrographic casts, bottom sampling, and echosounding.

## REMARKS

Ship designed to operate various types of fishing gear: purse-seine, long line drift, net, mid-water and bottom trawl A.S.O. Fresh water supply is limiting range factor. Name derived from Indian mythology after god of the sea.



# INDONESIA

## SECTION 30

# SAMUDERA

NO PHOTO AVAILABLE

TYPE: Steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1951	118'				541	210

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
9.5	10.8	Controllable		14 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
27	6

## **AFFILIATION**

Institute of Marine Research, Central Institute of Nature Research, Djakarta.

## **PROPULSION**

Diesel engine, single screw, controllable pitch. Uses Solar Oil; has 27 ton fuel capacity.

## **ELECTRICAL POWER**

Ship generates 19.8 KW. Has 110V DC available for scientific work.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - No information.

Communication - Radio-telephone, wireless send-receive set, and radio-receiver.

Echosounders - Kelvin-Hughes echosounder (range 1,300 m.).

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has all purpose winch for loading etc., and winch for hydrographic and oceanographic work with 2,500 m. of 5/32" wire.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Has one laboratory (6 m. x 5.5 m.) with fresh water taps, electrical outlets, and propane gas.

## **HABITABILITY**

Has air blower system in all compartments. Carries 26 tons of fresh water. Distillation equipment for laboratory only. No salt water showers.

### OTHER FEATURES

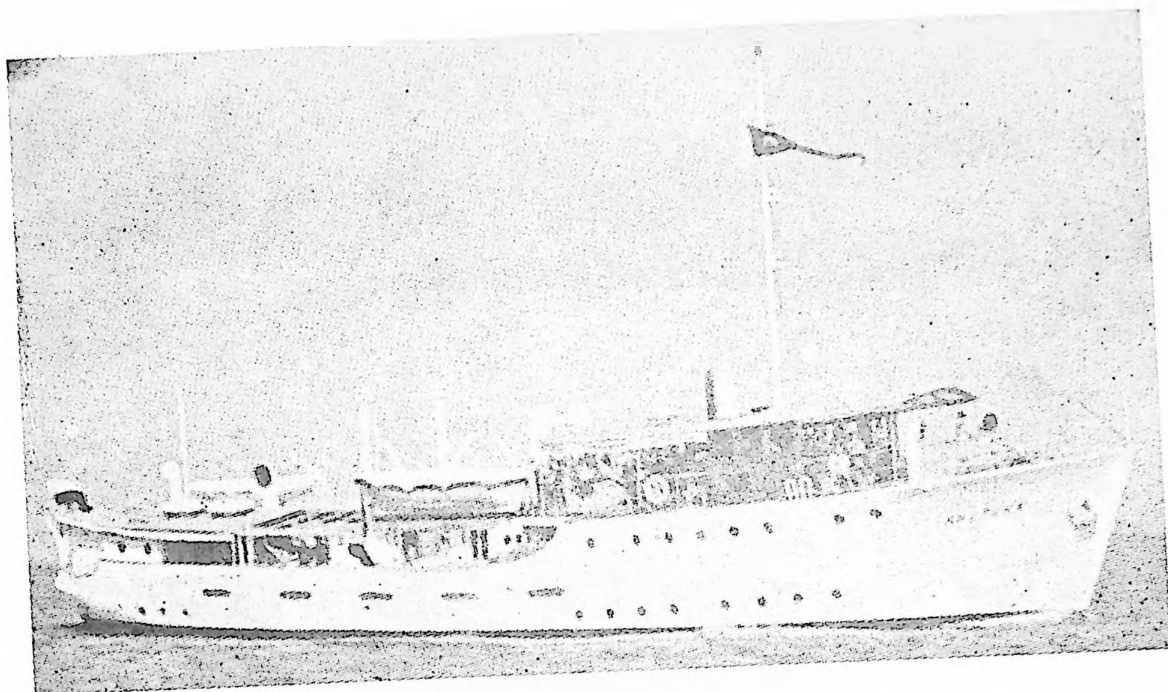
No antirolling devices; ship can perform oceanographic work up to Sea State 6.

### TYPE OF OBSERVATIONS

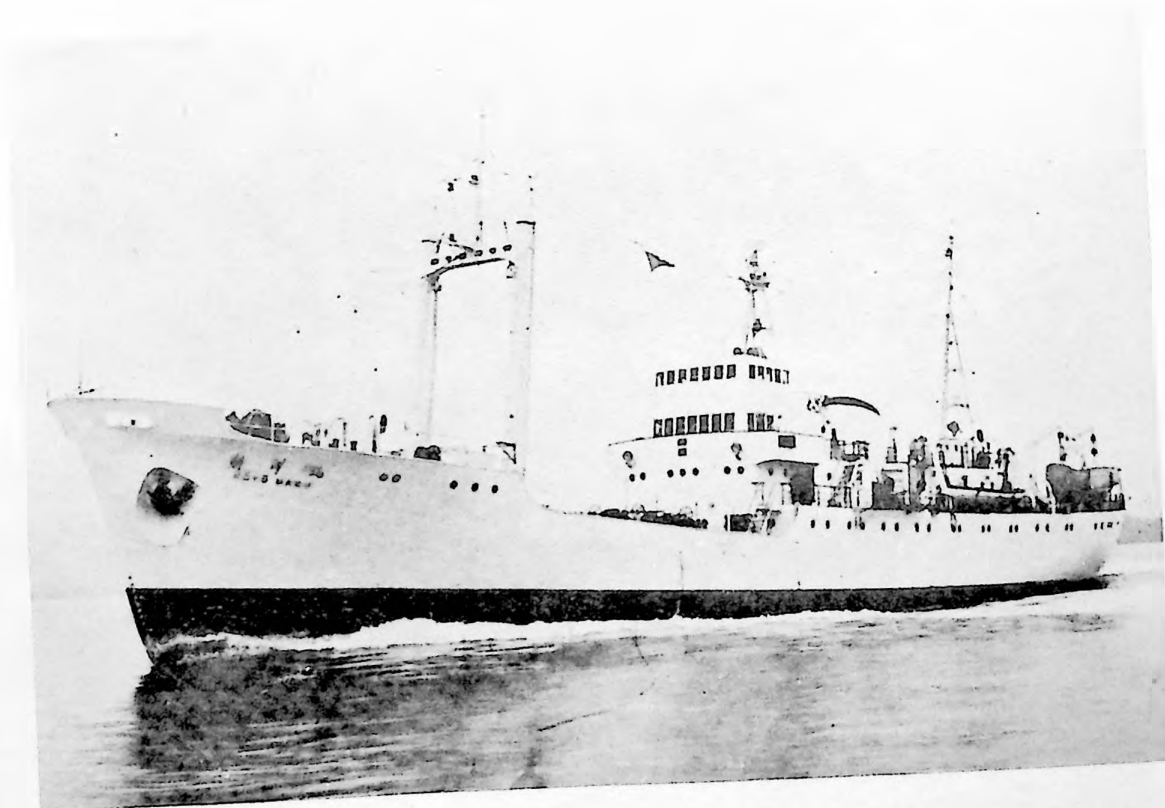
Bottom sampling. Could perform more oceanographic and marine biological research with minor equipment additions.

### REMARKS

None.



SAMUDERA, paste on page 30.1

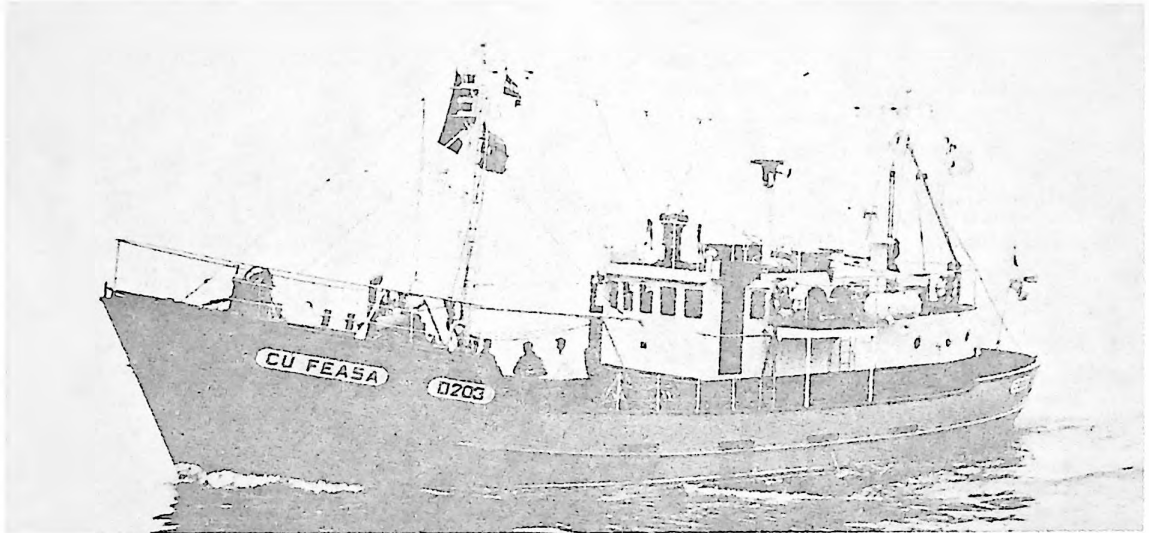


KOYO MARU, paste on page 36.11

# **IRELAND**

## **SECTION 33**

## CU FEASA



**TYPE:** Steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1960	80'	19.6'	10.9'		92.9	

### PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
8.5	10.8		1,500 miles	

### COMPLEMENT

CREW	SCIENTIFIC STAFF
8	4

## **AFFILIATION**

Department of Lands, Fisheries Divison, 3 Cathal Brugha Street, Dublin.

## **PROPULSION**

Duetz diesel 310 BHP, with controllable-pitch propeller. Carries 8.15 tons of fuel oil. Equipped with mizzen sail.

## **ELECTRICAL POWER**

Has a Lister generator, 40 KW and 5 KW shaft generator producing 110V DC.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Kelvin Hughes radar, 48 mi. range. Anschutz gryocompass.

Communication - Coastal radio "Nimbus", 44 mi. range.

Echosounders - Marconi "Seagraph", 48 KC range, 3,780 ft. and Elac "Atair" 30 KC, range 3,360 ft. Also has Kelvin Hughes "Fishermans" asdic, 50 KC range, 6,000 ft.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Two Hydravlik A/S Brattvag winches 10 HP and 30 HP, both with 1,800 ft. of cable. Kelvin Hughes sounding machine used for nansen casts and plankton tows.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Has 4.25 sq. m. space available for laboratory.

## **HABITABILITY**

Carries 3.96 tons of fresh water.



### OTHER FEATURES

Has Tenfjord automatic steering. Fitted with sal log.

### TYPE OF OBSERVATIONS

Hydrographic casts, bottom samples, plankton tows, exploratory fishing, and hydrographic survey.

### REMARKS

Roll recovery is slow and she takes water over the deck. Generally works in the seas around Ireland.

# ITALY

## SECTION 35

# DAINO

NO PHOTO AVAILABLE

TYPE: Corvette (ex-German type).

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
	66.9 m.	8.9 m.	2.2 m. (full)	821 tons (full)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
	13	3		3 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
	11

## **AFFILIATION**

Ministry of Marine Defense.

## **PROPULSION**

Two Schultz Marine boilers, triple expansion, twin screw, 2,150 HP.  
Uses gasoline; capacity 142 tons.

## **ELECTRICAL POWER**

Has available 110V DC.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass, magnetic compass, radar, and echosounder.

Communication - No information, presumed to have adequate equipment.

Echosounder - One Atlas Werke for deep soundings.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One steam winch on stern. Two electric winches on bow. One electric winch, stern, with 3,000 m. of wire. One hand winch, amidships, with 600 m. of wire.

## **ACOUSTICAL CHARACTERISTICS**

Acoustical work not possible, auxiliary engine very loud.

## **LABORATORIES**

One photographic room, and one room used to keep Swallow buoys.

## **HABITABILITY**

Not suitable for working in polar or tropical zones.

## **OTHER FEATURES**

None.

**TYPE OF OBSERVATIONS**

Hydrographic survey.

**REMARKS**

Short endurance limits capabilities as an oceanographic vessel.

## F. VERCELLI

NO PHOTO AVAILABLE

TYPE: No information.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
	60'	20'	7'	4.8 tons		

### PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
7	9			

### COMPLEMENT

CREW	SCIENTIFIC STAFF
5	2

#### **AFFILIATION**

Observatory of Experimental Geophysics.

#### **PROPULSION**

Has 90 HP engine.

#### **ELECTRICAL POWER**

Available currents: 110V AC, 3 KVA, 60-cycle, single-phase and 110V DC, 10 KW. Constant frequency current available.

#### **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - RCA radar.

Communication - Collins TCS12 transmitter and receiver, transmitting on 1850, 3200 KC and others. Receives on all frequencies.

Echosounder - Atlas-Werke 646.

#### **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has one BT winch with 1,500' of wire, and anchoring winch with 1,000' of cable.

#### **ACOUSTICAL CHARACTERISTICS**

No information.

#### **LABORATORIES**

No information.

#### **HABITABILITY**

No information, presumably limited to local nearshore work.

#### **OTHER FEATURES**

Western gravity meter with bathysphere.

**TYPE OF OBSERVATIONS**

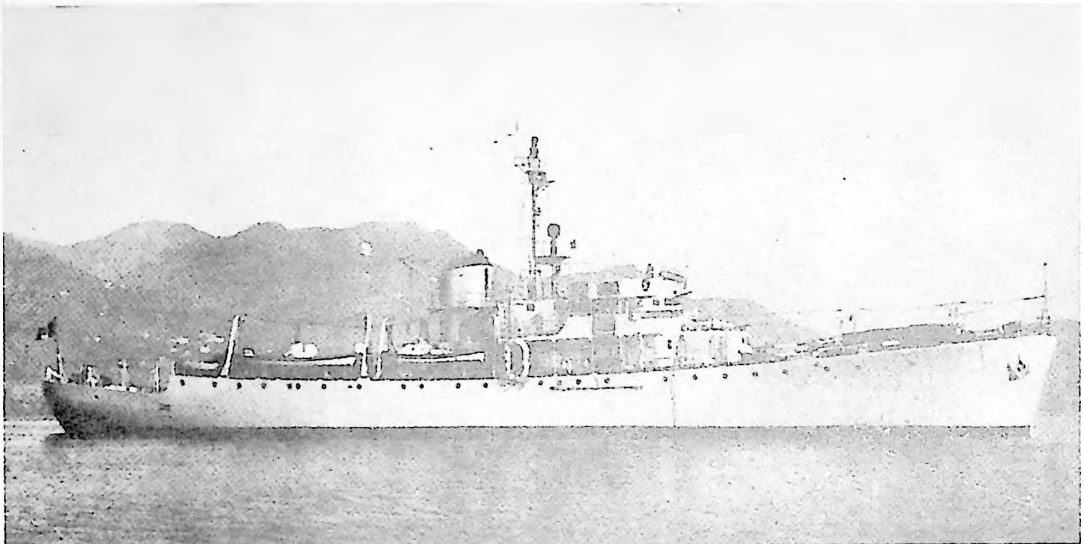
Sea gravity surveys.

**REMARKS**

None.



# STAFFETTA



**TYPE:** Built as a Canadian Frigate (ex-ELBANO) and then adapted as a Hydrographic Ship, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1943	61.5 m.	9.9 m.	4.4 m	1,280 tons (full)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
	10	3	5,500 miles	10 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
	15

## **AFFILIATION**

Hydrographic Institute of the Navy.

## **PROPULSION**

One reciprocating engine, triple expansion, two boilers, single screw, 2,750 IHP. Uses gasoline; capacity 350 tons.

## **ELECTRICAL POWER**

Has 110V DC and 220V AC for auxiliary instruments.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass, magnetic compass, radar (RCA type AN/SPN-5 AX), log, and echogoniometer (Sofar P.600).

Communication - No information, but presumed adequate.

Echosounders - One AN/UQN (mfg. Ditta EDO Corp.) echosounder, 12 KC, for shallow and deep waters, range 6,000'. One Atlas Werke, 30 KC, for medium depths to 1,600 m. One Atlas Werke, 80 KC for shallow water.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One electric winch with 6,000 m. of 6.5 mm. wire located on stern.  
One electric winch, 25 HP, with 3,500 m. of 13 mm. wire.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Has photographic laboratory and one room for oceanographic instruments and for pH measurements.

## **HABITABILITY**

Not adapted for tropical work. Carries 20 tons of fresh water (limiting endurance factor); no distillation apparatus.

**OTHER FEATURES**

None.

**TYPE OF OBSERVATIONS**

Primarily hydrographic survey ship but performs also as oceanographic vessel. Capable of seismic work, current measurements, water sample collecting, and meteorological observations.

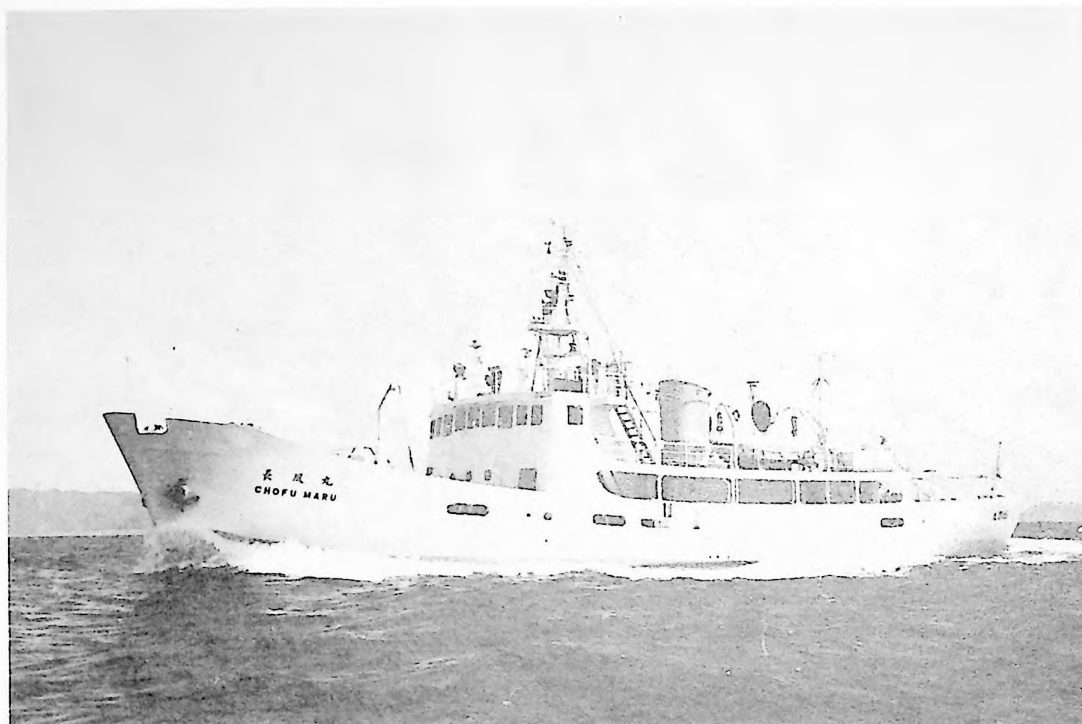
**REMARKS**

None.

# JAPAN

## SECTION 36

# CHOFU MARU



**TYPE:** Research Ship, steel.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1960	42.0m. (overall)	7.4 m.	2.9 m. (full)	458 tons (full)	266	80

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
10	11	4	6,000 miles	25 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
23	15

## **AFFILIATION**

Owned and operated by Nagasaki Marine Observatory, Japan Meteorological Agency.

## **PROPULSION**

Diesel-electric, single screw, 500 HP. Uses heavy oil, capacity 70 tons.

## **ELECTRICAL POWER**

Two 50 KW generators; requires 25 KW for normal ship operations, 20 KW is available for scientific work. Has 220V AC and 100V AC current.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Equipped with the latest gear (all Japanese manufactured). Specific information is not available except for the radar (TEN Radar MD-802, Kobe Kagyo Co.).

Communication - Short and medium wave transmitter, 250W, sub-transmitter 50W, three receivers.

Echosounder - Has one Hughes type, range 0-4,000 m., time measuring device endless helical contact method.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Three winches now on board. A 15 HP hydrographic winch (Tsurumi-Seiki Co.) under forecastle deck, with 8,000 m. of wire. A 7.5 HP hydrographic winch (Tsurumi-Seiki Co.) on starboard side of after passage with 3,000 m. of 2.4 mm. wire. A 2 HP BT winch (Rigo-Sha Co.) on starboard side of after deck with 1,000 m. of 2.4 mm. wire.

## **ACOUSTICAL CHARACTERISTICS**

Unknown.

## **LABORATORIES**

Has one laboratory (4 x 6 m.) for physical, chemical, and biological investigations, with running water, electrical outlets, heating and ventilation.

### **HABITABILITY**

Ship is bright and airy and has considerable space. Heated and ventilated. Carries 70 tons of fresh water, no distillation facilities. The crew's quarters aft have pullman type bunks with tables in the center of the space for meals, recreation, or study.

### **OTHER FEATURES**

Water jet located just beneath stern capable of being pivoted about in various directions and enables the ship to maneuver in very little space.

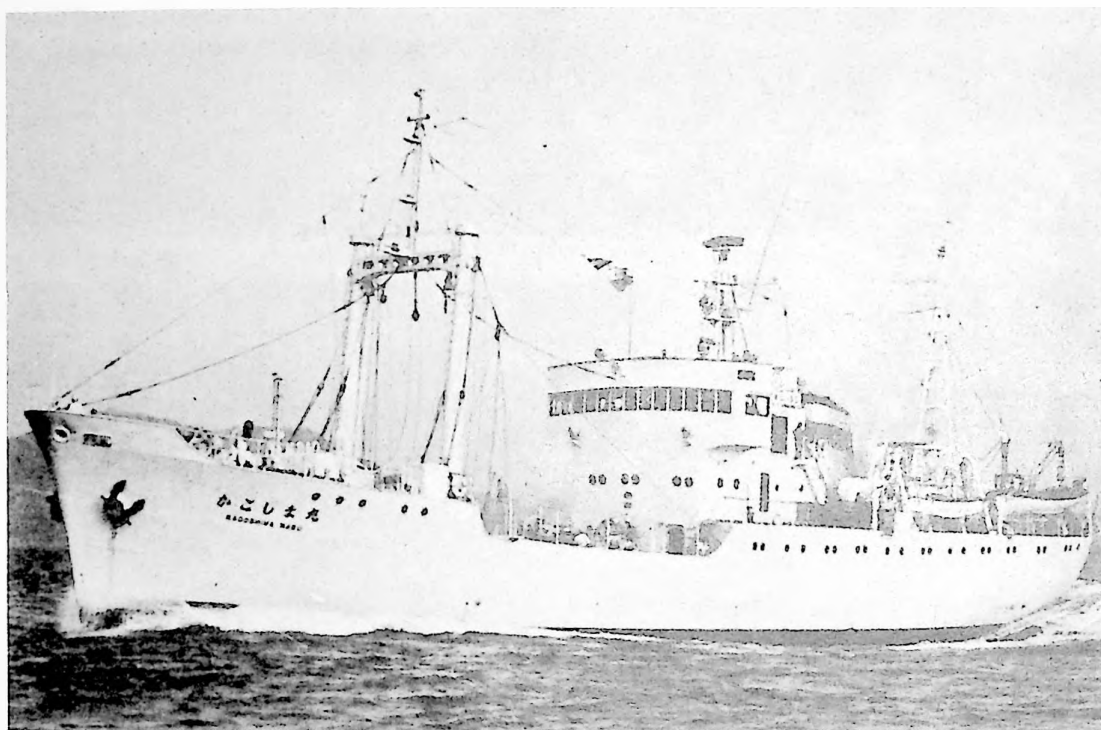
### **TYPE OF OBSERVATIONS**

Meteorological and oceanographic research, hydrographic casts, GEK, and BT.

### **REMARKS**

None.

# KAGOSHIMA MARU



**TYPE:** Built specifically for training and research, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1960	60.5 m.	10.8 m.	5.4 m. (full)	635 tons	1,200	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
12.5	14.5	6.0	12,900 miles	43 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
42	53 (mostly students)



## **AFFILIATION**

Research and training ship for Kagoshima University.

## **PROPULSION**

Diesel engine, single fixed-blade screw, 1,700 HP. Uses heavy oil "A," tank capacity 3,495 tons.

## **ELECTRICAL POWER**

Ship generates 75 KW DC and 600 KW AC. Ship has three generators of 440V AC, 60-cycle, 200 KVA each and one dynamo of 230V 75 KW. Other currents available with transformers: 220V AC and 110V AC, 60-cycle, and 24V DC, 480 amp.-hrs. (batteries).

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Has loran, radar (Decca TM909, RCA CR-103), direction finder.

Communication - Two radio-telephone transmitters, range 148-162 MC and 1.6-4 MC; two receivers, range 90 KC-24 MC and 14 KC-4 MC; two CW transmitters, range 3-24 MC (12 freq.) receiver, range 3-30 MC.

Echosounders - Has five echosounders. Van Graph with ranges of 0-50 and 0-100 m., Nippon Electric (Marine Graph) with highest ranges 0-1,920 m., another Nippon Electric (Type 811) with highest range of 0-10,000 m. and two precision portable devices (Portable Precision and Fish Mirror) with an accuracy of plus or minus 3 centimeters.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has one trawl winch with 9,800 m. of 8 to 18 mm. tapered wire. Three oceanographic winches with 5,000 m. of 4 mm. wire, 3,000 m. of 6 mm. wire, and 1,500 m. of 2 mm. wire. Also two portable hand operated winches, each with 500 m. of 4 mm. wire.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

One laboratory (21.7 sq. m.) located on the upper deck above the engine room; equipped for physical, chemical, and biological analyses. Large mess hall doubles as lecture room.

## **HABITABILITY**

Ship air-conditioned, ventilated and very habitable and prepared to operate in all navigable areas for extended periods of time. Carries 206 tons of fresh water and has distillation apparatus. Salt water showers available.

## **OTHER FEATURES**

Has large deep freeze compartment for storage of marine biological specimens. No antirolling devices. Ship can operate up to moderate sea state. Reduction of speed to 6 knots required by rough seas.

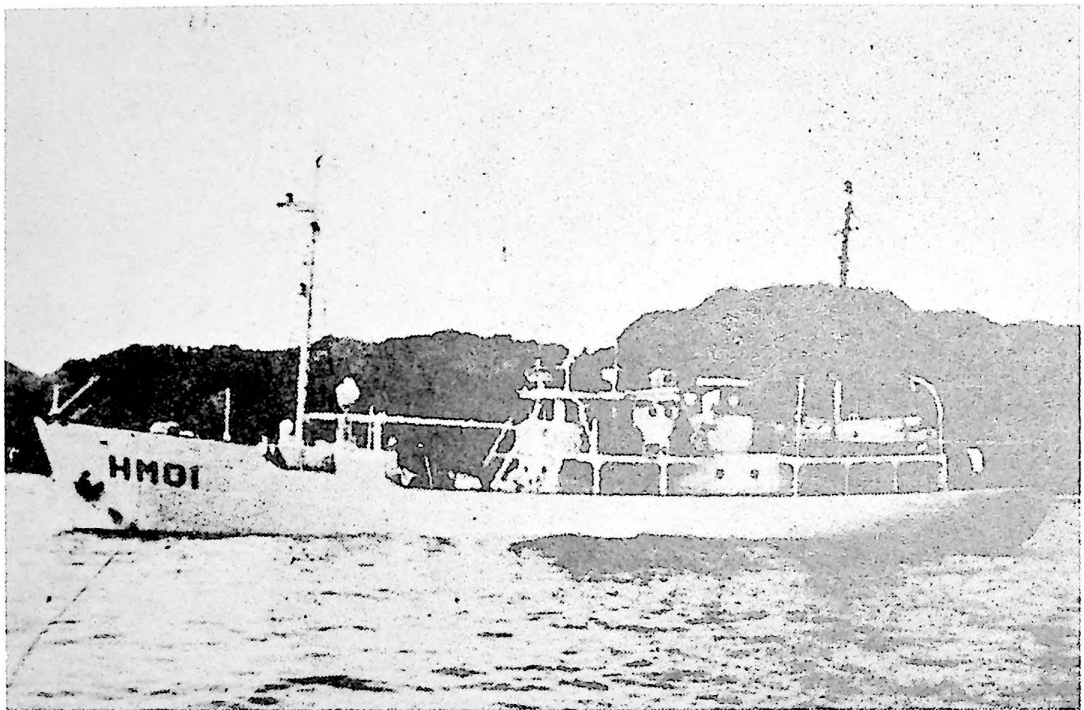
## **TYPE OF OBSERVATIONS**

Primarily used for fisheries research and training of fishing boat captains. Oceanographic observations are part of this program, including BT, GEK, and bottom sampling.

## **REMARKS**

None.

# KAIYO



**TYPE:** Trawler, twin-masted, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1942	37.0 m	6.9 m	3.3 m.	277.0 tons (full)	202.3	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
10				

## COMPLEMENT

CREW	SCIENTIFIC STAFF
21	20

## **AFFILIATION**

Hydrographic Division of the Maritime Safety Board.

## **PROPULSION**

Diesel engine, 400 HP.

## **ELECTRICAL POWER**

No information.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

No information, presumed to have adequate equipment for navigation, communication, and echosounding.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has one 5 HP winch with 3,000 m. of wire and two 3 HP winches with 1,500 m. of wire each.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

No information.

## **HABITABILITY**

No information.

## **OTHER FEATURES**

No information.

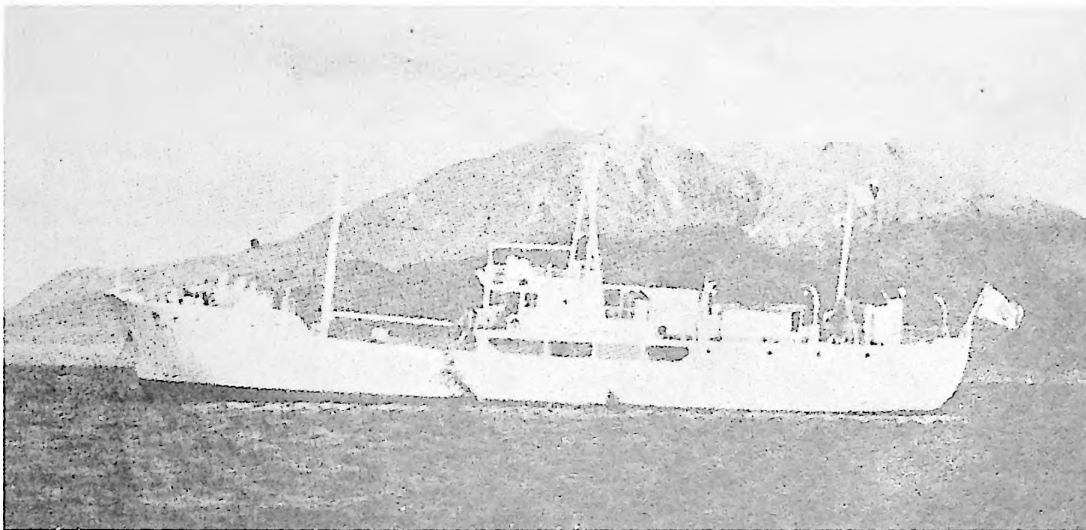
## **TYPE OF OBSERVATIONS**

Current observations (GEK), BT, and general oceanographic observations.

## **REMARKS**

None.

# KEITEN MARU



**TYPE:** Steel hull, Research Ship.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
					265	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
8.5				

## COMPLEMENT

CREW	SCIENTIFIC STAFF
	Several

**AFFILIATION**

Kagoshima University.

**PROPULSION**

No information.

**ELECTRICAL POWER**

No information.

**NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

No information, but presumed to have adequate equipment for navigation, communication, and echosounding.

**HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has one 5 HP winch with 5,000 m. of wire.

**ACOUSTICAL CHARACTERISTICS**

No information.

**LABORATORIES**

No information.

**HABITABILITY**

No information.

**OTHER FEATURES**

No information.

**TYPE OF OBSERVATIONS**

General oceanographic observations.

**REMARKS**

None.

# KOYO MARU

NO PHOTO AVAILABLE

TYPE: Steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1958	72.0 m.	11.2m.	5.6 m.	-	1,215.3	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
13.0	15.2	4.3	15,000 miles	45 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
44	5

## **AFFILIATION**

Fisheries College, Shimonoseki.

## **PROPULSION**

Diesel, 2-cycle engine, single fixed-blade screw, 800 BHP. Uses marine diesel fuel, capacity 368.3 tons.

## **ELECTRICAL POWER**

Normal ship operation requires 70 KW. Has two generators of 224 KW each, 440V, 60-cycle. Also has (3) 40 KVA transformers for 220V, 60-cycle and (5) 30 KVA transformers for 110V, 60-cycle. From batteries 480 amp.-hrs. available.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Radar (MK II), loran and gyrocompass.

Communication - CW equipment, 1 KW, frequencies: 4181, 6271.5, 8362, 1254.3, 1674.2, and 2224.0 KC, and 4.23 MC. One voice transmitter, 500W, frequencies: 1605, 2182, 2430, 2785, and 3950 KC.

Echosounders - One Kaijo Denki DH 14 KC, one V-2 200 KQ and a 50 KC portable sounder, maximum range 7,000 m. Ship must reduce speed to 6 kts. for sounding in deep waters.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has one trawl winch with 1,200 m. of 26 mm. wire. Three sounding winches with 5,000 m. of 4 mm. wire, 3,000 m. of 4 mm. wire, and 3,000 m. of 2 mm. wire.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Has laboratory for oceanographic, biological, and chemical analyses.



### **HABITABILITY**

Comfortable quarters, air-conditioned; medical facilities. Carries 300.7 tons of fresh water, has distillation apparatus, no salt water showers. Capable of working in all ice-free waters.

### **OTHER FEATURES**

Has abundant radioactivity detection equipment on board. Can make observations up to Sea State 7.

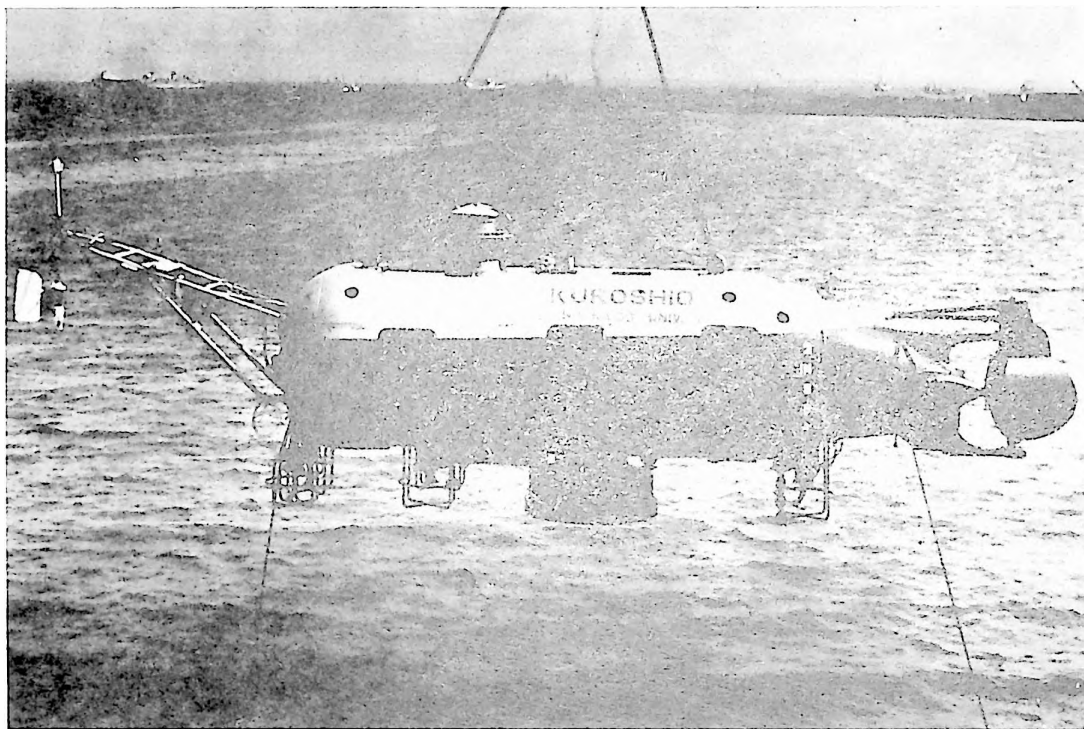
### **TYPE OF OBSERVATIONS**

Current measurements, BT, radioactivity determinations, hydrographic casts, soundings.

### **REMARKS**

None.

# KUROSHIO



**TYPE:** Specially built Reconnaissance (research) Submarine.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1960	11.3 m.	2.2 m.	1.9 m.	11.5 tons (weight in air)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
3 (under-water)				24 hours (maximum submergence)

## COMPLEMENT

CREW	SCIENTIFIC STAFF
4 (Total)	

## **AFFILIATION**

Fisheries Department of Hokkaido University.

## **PROPULSION**

Has 440V AC, 3.7 KW propelling motor. Horizontal and vertical rudders steer the vessel.

## **ELECTRICAL POWER**

No information.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

No information.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Does not require any.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

None.

## **HABITABILITY**

Maximum of 24 hrs. submerged.

## **OTHER FEATURES**

Equipped with 5 underwater searchlights and 16 observation windows. Has on board photographic equipment, dredge, sound gauge, tide gauge, direction finder, telephone, and electric hydrothermometer. Maximum depth of submergence 200 meters.

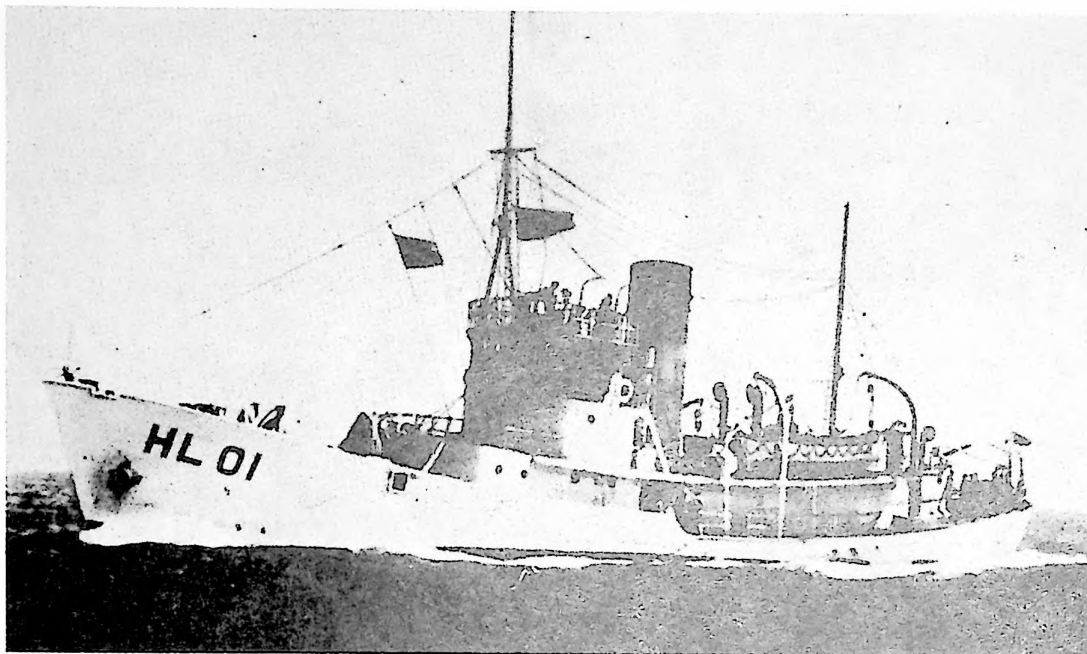
## **TYPE OF OBSERVATIONS**

Primarily built for geological investigation of sea-bottom, but also used for oceanographic and fisheries research.

## REMARKS

Originally built at request of National Railways Corporation to investigate ocean floor off Hakodate and Aomori where undersea tunnel is planned.

# MEIYO



**TYPE:** Steel hulled Ocean Tug.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
	44 m.				355	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
9.0				

## COMPLEMENT

CREW	SCIENTIFIC STAFF
	8

## **AFFILIATION**

Hydrographic Division of the Maritime Safety Board.

## **PROPULSION**

Diesel engine, 1,400 HP.

## **ELECTRICAL POWER**

No information.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

No information on navigation and communication equipment, but believed to have adequate facilities. Two echosounders on board, 8,000 m. and 1,000 m.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has two 5 HP winches, each with 3,000 m. of wire and one 3 HP winch with 4,000 m. of wire.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

No information.

## **HABITABILITY**

Capable of operations in all waters around Japan.

## **OTHER FEATURES**

No information.

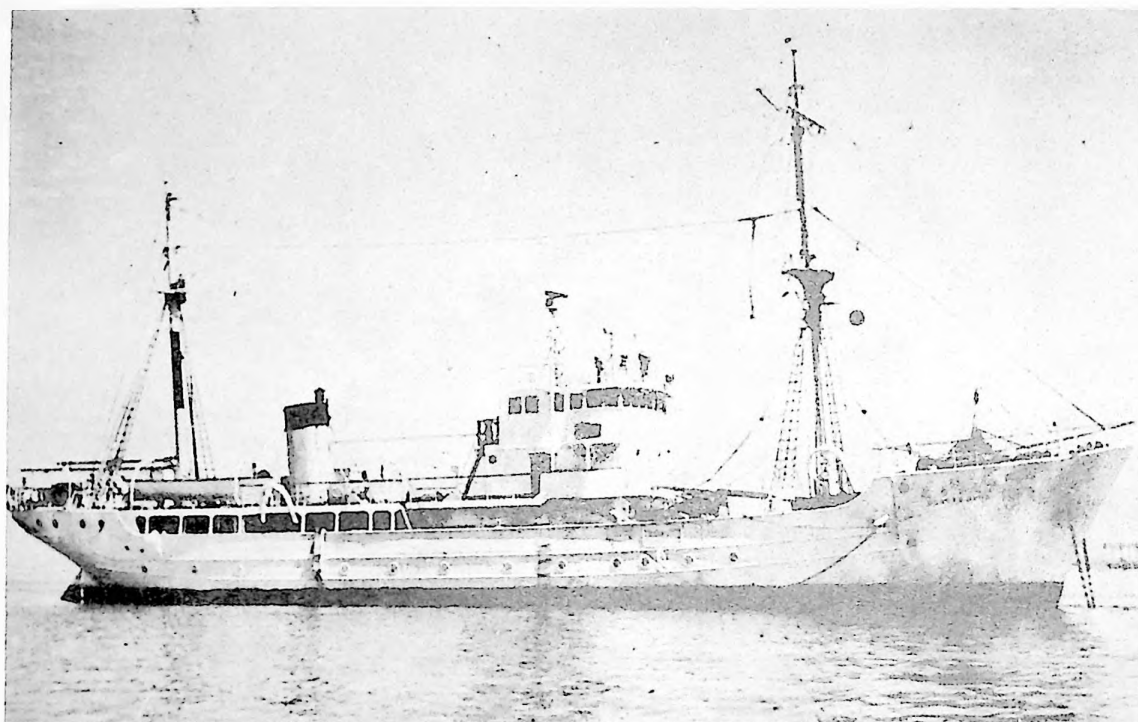
## **TYPE OF OBSERVATIONS**

General oceanographic observations.

## **REMARKS**

None.

# OSHORO MARU



**TYPE:** Training and Research Ship, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1927	46.8 m.	9.1 m.	3.8 m. (full)	969 tons (full)	616.7	213.5

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
8.5	11.3	5	7,200 miles	50 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
38	5 scientists 40 cadets

## **AFFILIATION**

Faculty of Fisheries, Hokkaido University, Hakodate.

## **PROPULSION**

Diesel, single fixed-blade screw, 800 HP. Uses diesel oil "A," tank capacity 110 cu. m. Formerly had sails but were removed in 1942.

## **ELECTRICAL POWER**

Ship generates 95 KW, normal ship operations require about 45 KW, leaving about 50 KW for scientific work. Available currents are 100V AC, 50-cycle, 5 KVA, and 100V DC 95 KW.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass, magnetic compasses, ship log, loran, radar (Sperry Marine Radar MK2-DO), direction finder.

Communication - Voice transmitter, 5 freq., 60-kilometer range. Wireless, 6 freq. 600-7,000 kilometers.

Echosounder - Nippon Electric Co. Type 103, range 1,800 m., accuracy  $\pm 2$  m. to 160 m. and  $\pm 10$  m. deeper than 160 m.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has two trawl winches, 90 HP each, can be driven electrically or by steam. Each winch has 350 m. of 22.5 mm. steel warp. Has one electromotive hydrographic winch, 5 HP, with 2,500 m. of 2.7 mm. steel wire. Has manual winch for shallow casts with 300 m. of 2.7 mm. steel wire.

## **ACOUSTICAL CHARACTERISTICS**

Cannot be made noiseless.

## **LABORATORIES**

Two laboratories, one for chemical and plankton analyses and one for bacteriological studies. Total laboratory area, 380 sq. m.



### **HABITABILITY**

Blower supplies air to all living quarters. Living quarters steam heated. Carries 126 cu. m. of fresh water, distillation capacity 2 tons/day. No salt water showers.

### **OTHER FEATURES**

Has large freezer chamber and cold storage area. With bilge keels ship can make oceanographic observations in winds up to about 15 m./sec.

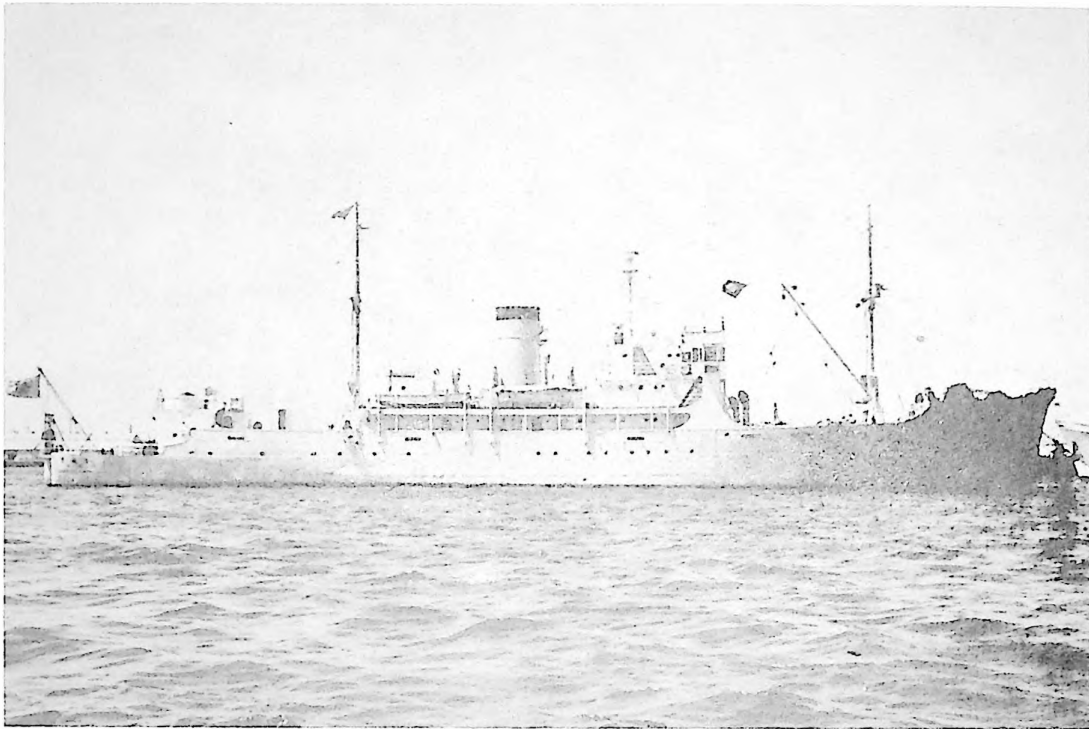
### **TYPE OF OBSERVATIONS**

Hydrographic cast (to 2,000 m.), bottom sampling, plankton haul, net tows.

### **REMARKS**

Plans are being made to replace this vessel by new one in 1962.

# RYOFU MARU



**TYPE:** Research Ship, steel.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1937	74.3 m.	10.6 m.	4.6 m. (full)	1,867 tons (full)	1,200	543

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
9	12	4	7,200 miles	37 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
42	20

## **AFFILIATION**

Division of Marine Meteorology, Japan Meteorological Agency, Tokyo.

## **PROPULSION**

Two diesel-engines, twin screws, 1400 HP. Uses heavy oil, tank capacity 163 tons.

## **ELECTRICAL POWER**

Two dynamos of 220V and 40 KW each; used alternately. DC converted to 100V AC, 50-cycle, 5 KW by converters. Thirty-two amp.-hrs. of 8V DC available from batteries.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - No information, but presumably well equipped.

Communication - Short and medium wave transmitter, 500W, and 50W subtransmitter. Three receivers.

Echosounders - Two Hughes type, range 0-11,000 m., time measuring device, endless helical contact method, power 2 KW, freq. 14 KC.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

A 150 HP dredging winch (Ishikawa-Jima Heavy Industrial Co.) with 13,000 m. of tapered 9-17 mm. wire. A 5 HP hydrographic winch (Tsurumi-Seiki Co.) with 4,000 m. of 2.4 mm. wire. Another 3 HP hydrographic winch (Tsurumi-Seiki Co.) with 1,500 m. of 2.4 mm. wire. A 2 HP BT winch (Tsurumi-Seiki Co.) with 1,000 m. of 2.3 mm. wire.

## **ACOUSTICAL CHARACTERISTICS**

Unknown.

## **LABORATORIES**

Has marine observatory room (12 sq. m.), a chemical laboratory (8.8 sq. m.), a meteorological observatory room (6 sq. m.). Laboratories have electrical energy available, are not air-conditioned.

## **HABITABILITY**

Heating only. Carries 166 tons of fresh water, no distillation, salt water showers available.

## **OTHER FEATURES**

Has scientific freezer space (3 cu. m.). No antirolling device. Ship can make observations up to Sea State 6.

## **TYPE OF OBSERVATIONS**

Hydrographic casts, bottom sampling (coring, dredging), extractions of large volumes of water, soundings, BT, current measurements, radio-activity measurements.

## **REMARKS**

None.

# SHINYO MARU

NO PHOTO AVAILABLE

TYPE: Steel Trawler.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1937	39.4 m.	7.0 m.	3.2 m.	474.5 tons	236	-

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
11			7,000 miles	28 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
23	2

## **AFFILIATION**

Ministry of Education.

## **PROPULSION**

Has 450 HP engine. Uses heavy oil, capacity 51 tons.

## **ELECTRICAL POWER**

Has 115V DC, 50 KW and 115V DC, 25 KW which is convertible to AC.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Radar, loran, direction finder, and others.

Communication - Short and medium wave transmitters, 250W and a 10W super-heterodyne receiver for all wave lengths.

Echosounder - Has one 14.5 KC echosounder.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has two winches, one 5 HP with 5,000 m. of wire and one 3 HP with 3,000 m. of wire.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Has 12 sq. m. area where laboratory facilities available.

## **HABITABILITY**

Carries 35 tons of fresh water.

## **OTHER FEATURES**

Bridge deck. No antirolling device.

**TYPE OF OBSERVATIONS**

Oceanographic and fisheries research.

**REMARKS**

Also used as Fishing Training Vessel for up to 30 cadets.

# SHOYO MARU

NO PHOTO AVAILABLE

**TYPE:** Steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1956	51.0 m.	8.5 m.	4.5 m.	-	603	-

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
11.5	12	10	9,000 miles	35 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
48	5



## **AFFILIATION**

No information.

## **PROPULSION**

Diesel engine, single screw, 1,200 HP. Uses heavy oil, capacity 260 tons.

## **ELECTRICAL POWER**

Ship generates 140 KW. Currents available: 230V AC, 60-cycle, 140 KW and 24V DC, 200 amp.-hrs. from batteries. Also has controlled 110V, 140 KW.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Sperry radar and other general equipment.

Communication - No information, presumed adequate.

Echosounder - Nippon Electric Co. type 103, 14.2 KC, range 1,800 m., accuracy 2%; also carries two spare echosounders.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has trawling winch with 260 m. of 18 mm. wire. A hydrographic winch with 3,500 m. of 2 mm. wire and trolling winch with 700 m. of 18 mm. wire.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

One general laboratory, 12 sq. m.

## **HABITABILITY**

All rooms air-conditioned, quarters comfortable. Can operate in all ice-free waters. Carries 117 tons fresh water, has distillation apparatus, no salt water showers.

### OTHER FEATURES

Bilge keels. Can make observations up to Sea State 5.

### TYPE OF OBSERVATIONS

Hydrographic casts, trolling, sounding, BT, plankton tows, and shallow water dredging.

### REMARKS

None.

# SHUNPU MARU



**TYPE:** Research Ship, steel.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1954	35.2 m.	6.4 m.	2.3 m. (full)	246 tons (full)	150	36

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
10	11	3	4,000 miles	25 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
19	10

## **AFFILIATION**

Kobe Marine Observatory, Japan Meteorological Agency.

## **PROPULSION**

Diesel-engine, single screw, 310 HP. Uses heavy oil, 3-ton capacity.

## **ELECTRICAL POWER**

Two 25 KW generators; 15 KW required for normal ship operations, 10 KW available for scientific work. Currents available are 220V AC and 100V AC.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - No information, presumably well equipped.

Communication - Short and medium wave transmitter, 250W, and sub-transmitter, 50W. Has two receivers.

Echosounders - One on board.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One 5 HP hydrographic winch (Tsurumi-Seiki Co.) on port side of wheel deck with 5,000 m. of 2.4 mm. wire. One 3 HP BT winch (Tsurumi-Seiki Co.) with 1,500 m. of 2.4 mm. wire.

## **ACOUSTICAL CHARACTERISTICS**

Unknown.

## **LABORATORIES**

Has one laboratory (3 x 3 m.) for physical, chemical, and biological research, with running water, electricity, heating, and ventilation.

## **HABITABILITY**

Is heated and ventilated throughout. Carries 31 tons of fresh water, no distillation facilities.

**OTHER FEATURES**

None .

**TYPE OF OBSERVATIONS**

Hydrographic casts .

**REMARKS**

None .

# SOYA



**TYPE:** Scientific Vessel, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
-	83.7 m.	15.8 m.	9.3 m.	-	2,736	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
11.5	12.5	5	16,400 miles	60 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
94	34

## **AFFILIATION**

Hydrographic Division of the Maritime Safety Board.

## **PROPULSION**

Two diesel engines, fixed-blade screw, 4,800 HP. Diesel fuel capacity, 650 cu. m.

## **ELECTRICAL POWER**

Ship generates 70 KW AC and 360 KW DC, requires about 80% of this for normal operations. Currents available: 100V AC, 60-cycle, 70 KW and 220V DC, 360 KW.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Radar (Raytheon 1402), sonar (QCU-1), and others.

Communication - Radio-telephone and CW equipment, HF, MF, and LF.

Echosounders - Nippon Electric Co. 81, 16 KC, range 8,000 m., accuracy 1 part in 1,000.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has 5 HP hydrographic and coring winch with 6,000 m. of 3 mm. wire, and smaller 3 HP winch used for BT and hydrographic casts with 3,000 m. of 3 mm. wire.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Small laboratory for sea water analysis. Also has meteorological, geomagnetic, and cosmic ray laboratories.

## **HABITABILITY**

Comfortable quarters, partially air-conditioned. Can work in all navigable waters. Carries 569 tons of fresh water, has distillation apparatus and salt water showers.

### **OTHER FEATURES**

Carries helicopter.

### **TYPE OF OBSERVATIONS**

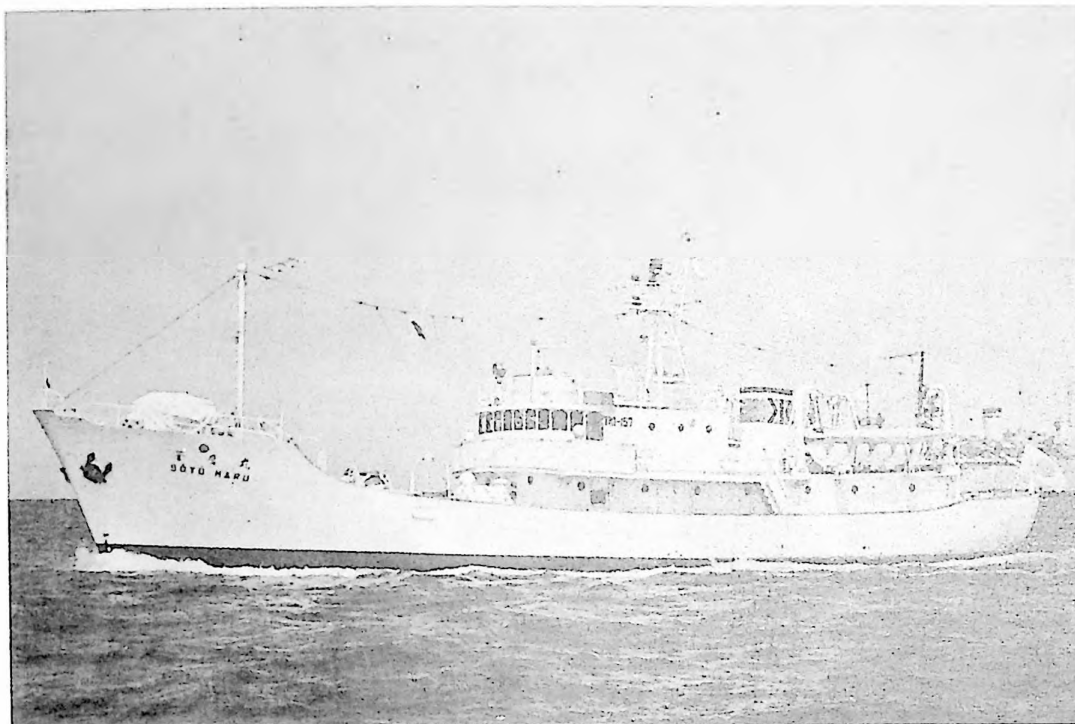
Hydrographic casts, BT, coring, and geomagnetic and meteorological observations.

### **REMARKS**

Overhauled and refitted in 1959.



# SOYO MARU



**TYPE:** Built specifically for oceanographic and biological research, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1955	36.0 m.	7.2 m.	3.8 m.	400 tons	258	122

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
8.5	12		12,000 miles	25 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
33	5 or more

## **AFFILIATION**

Research vessel for Tokai Regional Fisheries Research Laboratory, Fisheries Agency.

## **PROPULSION**

Main engine an airless diesel engine, 500 HP, 320 r.p.m. with remote control variable pitch propeller. Uses heavy oil, tank capacity 400 tons. Auxiliary engines for dynamo - two 75 HP diesel engines and one 17 HP diesel engine.

## **ELECTRICAL POWER**

Electrical power supplied by two 45 KW and one 10 KW dynamos. Also has 10 KVA motor generator. Currents available for scientific work, 60-cycle, AC and 110V DC. Batteries supply 104V, 120 amp.-hrs.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Direction finder, loran receiver, Anschutz gyrocompass, 12-inch radar, magnetic compass pilot.

Communication - Two middle short wave transmitters (250W and 50W), three super-heterodyne receivers.

Echosounders - Kaijo Denki K. K., Type 103, range 1,800 m., 14.2 KC. Kaijo Denki K. K., Type 811, range 10,000 m., 16 KC. Sanken K. K., range 800 m., 28 KC.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has four electric hydrographic winches all manufactured by Tsurumi Seiki K. K. One 3.5 HP with 1,500 m. of 2.2 mm. wire; one 7 HP with 5,000 m. of 2.2 mm. wire; one 2 HP with 1,500 m. of 2.2 mm. wire; and one 30 HP with 5,000 m. of 2.2 mm. wire.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Two laboratories, one 5.2 x 6 m. and the other 2 x 4 m. Electrical power available; equipped mainly with biological apparatus (incubator, X-ray radiograph, magnifying projector, etc.).

### **HABITABILITY**

Cannot work in tropics or the poles. Fresh water tank capacity 40 tons, no distillation apparatus.

### **OTHER FEATURES**

Rolling keels, can make observations in waves up to 4 m. Has a great variety of radioactivity detection devices, such as, scintillometer, Geiger-Müller counter, etc.

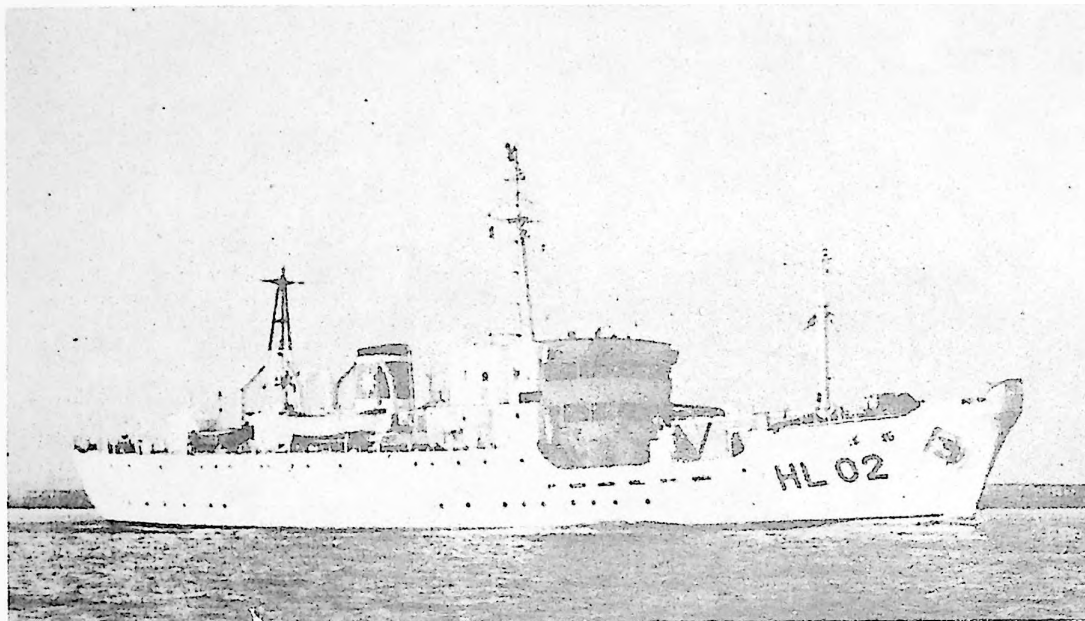
### **TYPE OF OBSERVATIONS**

Used primarily for fisheries and biological research. Hydrographic casts, BT, and continuous soundings.

### **REMARKS**

None.

# TAKUYO



**TYPE:** Steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1957	62.4 m.	9.5 m.	4.8 m.		770	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
12	14	6	8,000 miles	20 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
36	15

## **AFFILIATION**

Hydrographic Division of the Maritime Safety Board.

## **PROPULSION**

Two diesel engines, fixed-blade screw, 650 HP. Diesel fuel capacity 127 cu. m.

## **ELECTRICAL POWER**

Ship generates 8 KW AC and 80 KW DC, normal ship operations use about 80% of this. Currents available: 100V AC, 60-cycle and 220V DC.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Loran, radar, radio direction finder.

Communication - Radio-telephone, 35W, on frequencies 2130, 2182, 2245, and 2325 KC. CW equipment; A<sub>1</sub> 250W-A<sub>2</sub> 50W, 500 KC; A<sub>1</sub> 250W, 2091 KC; A<sub>1</sub> 500W, 4180 KC, 6270 KC, 8360 KC, 16720 KC, 22235 KC, and 8364 KC.

Echosounder - Nippon Electric Co. 81, range 9,700 m., accuracy 1 part in 1,000, tuning fork controlled timing. Speed limited to 12 kts. when sounding.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has 120 HP deep sea coring and dredging winch with 10,000 m. of 8.5 to 16 mm. tapered wire. Three hydrographic winches, 15 HP winch with 10,000 m. of 6 mm. wire; 5 HP winch with 4,000 m. of 3 mm. wire; and 3 HP winch with 3,000 m. of 3 mm. wire. BT winch has 1,500 m. of 3 mm. wire.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

One laboratory (36 sq. m.) with running water (fresh and salt) and electrical power (220V DC, 100V AC).

## **HABITABILITY**

Comfortable quarters, medical facilities. Can operate in all ice-free waters. Carries 115 tons of fresh water, no distillation apparatus, has salt water showers.

### OTHER FEATURES

Bilge keels allow hydrographic casts up to Sea State 4.

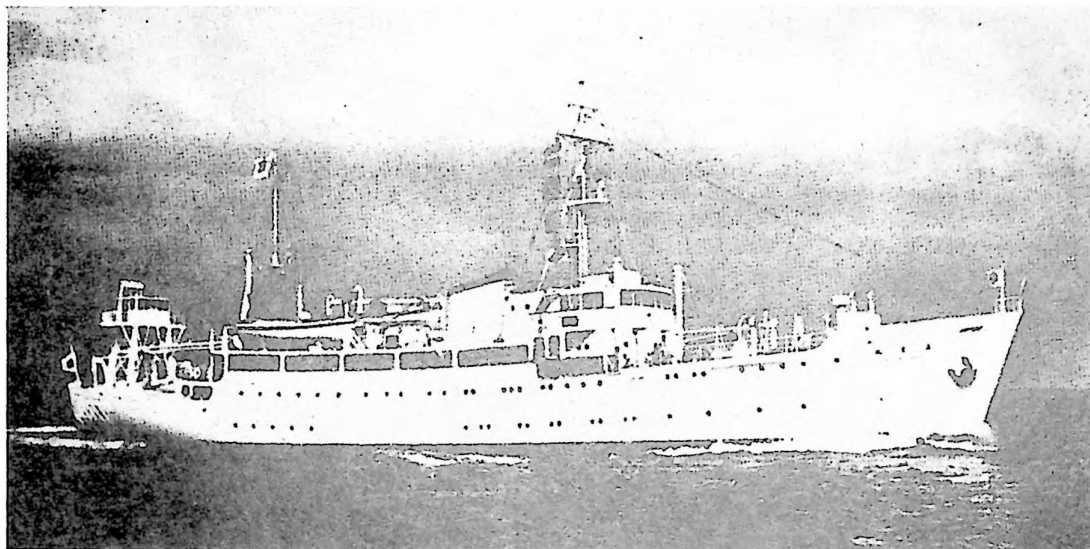
### TYPE OF OBSERVATIONS

Hydrographic casts, coring, dredging, BT, plankton tows, and current observations.

### REMARKS

None.

# UMITAKA MARU



**TYPE:** Training and Research Ship, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1955	73.4 m.	11.3 m.	5.5 m.	2,100 tons	1452.9	-

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
13	15	6.1	14,000 miles	30 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
51	13

## **AFFILIATION**

Ministry of Education.

## **PROPULSION**

Diesel, single fixed-blade screw, 2,100 HP. Uses heavy oil, capacity 327 tons.

## **ELECTRICAL POWER**

Ship generates 420 KW and requires about 100 KW for normal ship operations. Has three generators producing 420 KW, 440V, 60-cycle. With transformers 220V and 110V, 60-cycle available; by means of converter, 220V DC and 110V DC, and with batteries 24V DC.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Radar, loran, gyrocompass, direction finder, auto pilot, course recorder, etc.

Communication - Short wave 1 KW and medium wave 500 KW transmitters. super-heterodyne, short, medium, and long wave receiver. Radio-telephone.

Echosounders - Nippon Denk, type 103, range 1,800 m., 14.5 KC, very accurate. Kaijo Denki deep sea type, range 11,000 m., 9 KC, very accurate. Sanken Fishgraph, range 600 m., 50 KC, very accurate.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has 120 HP trawl winch, two drums, one with 1,100 m. of 26 mm. and the other with 8,500 m. of 11 mm. wire. One 15 HP hydrographic winch with 3,500 m. of 6 mm. wire. One BT and plankton winch with 5,500 m. of 2.2 mm. wire. Two cargo winches, one 20 HP, one 40 HP. One 50 HP windlass.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Has one laboratory divided into two parts: chemical laboratory and biological laboratory, has electrical outlets and water taps. Total laboratory space about 49 sq. m. Also has research room and analytical room.



### **HABITABILITY**

Very comfortable, has excellent medical facilities. Capable of working in all ice-free waters. Carries 252 tons of fresh water, has distillation apparatus, no salt water showers.

### **OTHER FEATURES**

Has bridge deck stern trawler and after observatory tower. With wide bilge keels, ship can make observations up to Sea State 5.

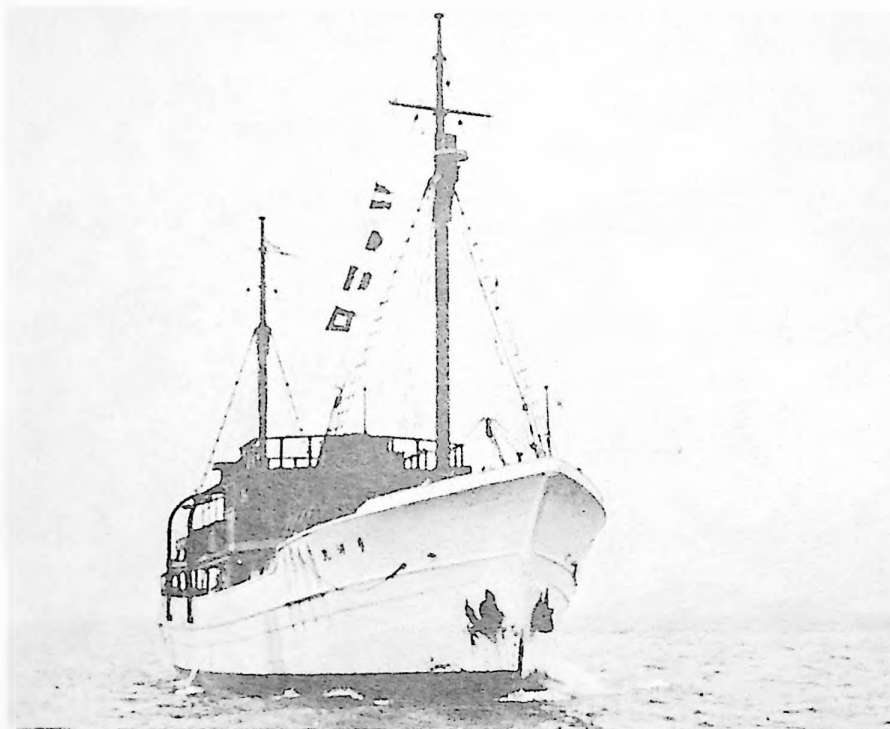
### **TYPE OF OBSERVATIONS**

Oceanographic and fisheries research, hydrographic surveys.

### **REMARKS**

When not used for research, used as a Fishing Training Vessel; carries 60 cadets.

# YUSHIO MARU



**TYPE:** Research Ship, wood.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1942	29.6 m.	6.6 m.	3.2 m. (full)	-	143	50

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
8	10	3	2,700 miles	20 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
20	8

## **AFFILIATION**

Hakodate Marine Observatory, Japan Meteorological Agency.

## **PROPULSION**

Diesel-electric, single screw, 250 HP. Uses heavy oil, capacity 19 tons.

## **ELECTRICAL POWER**

Two 10 KW generators; 5 KW required for normal ship operations, 5 KW available for scientific work. Has 110V DC current.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - No information, presumably well equipped.

Communication - Short and medium wave transmitter, 150W, and two receivers.

Echosounders - One on board.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One 3 HP hydrographic winch (Tsurumi-Seiki Co.) on port side of boat deck with 2,000 m. of 2.4 mm. wire. One 2 HP BT winch (Tsurumi-Seiki Co.) on port side under boat deck with 500 m. of 2.4 mm. wire.

## **ACOUSTICAL CHARACTERISTICS**

Unknown.

## **LABORATORIES**

Has one laboratory (3 x 3 m.) for physical, chemical, and biological research, with running water, electricity and heating.

## **HABITABILITY**

Heating only. Carries 12 tons of fresh water, no distillation apparatus.

**OTHER FEATURES**

None.

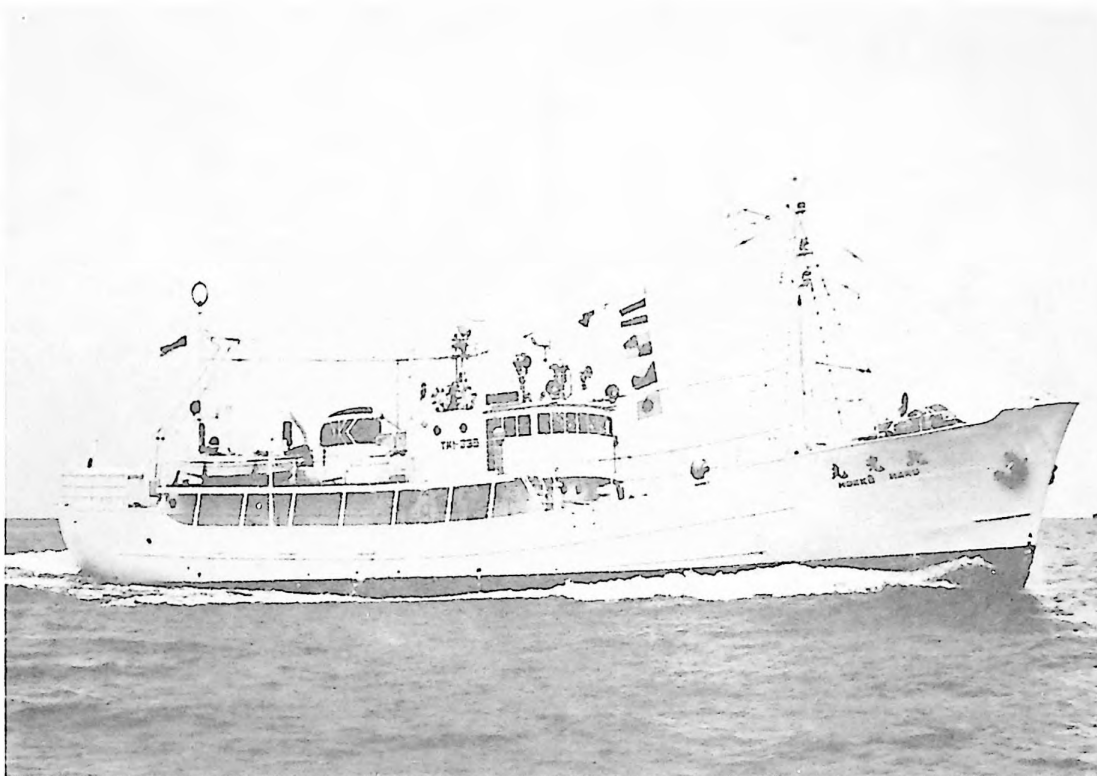
**TYPE OF OBSERVATIONS**

Hydrographic casts.

**REMARKS**

None.

# HOKKO MARU



**TYPE:** Fisheries Research and Inspection Vessel.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1960	33.0 m.	6.8 m.	3.4 m.		220.4	60.5

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
11.0	12.4		7,500 miles	

## COMPLEMENT

CREW	SCIENTIFIC STAFF
27 (total)	

## **AFFILIATION**

Fisheries Agency

## **PROPULSION**

Diesel engine, 550 BHP with supercharger. Fuel oil tank capacity 69.95 cu. m.

## **ELECTRICAL POWER**

Ship generates 40 KVA, 230V (2x).

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Radar, loran, direction finder, gyrocompass, etc.

Communication - Transmitter, receiver and facsimile equipment.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Two hydrographic winches with 3,000 m. wire and 1,500 m. wire.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

No information.

## **HABITABILITY**

Fresh water tank capacity 41.82 cu. m.

## **OTHER FEATURES**

Fish hold capacity 22.21 cu. m.

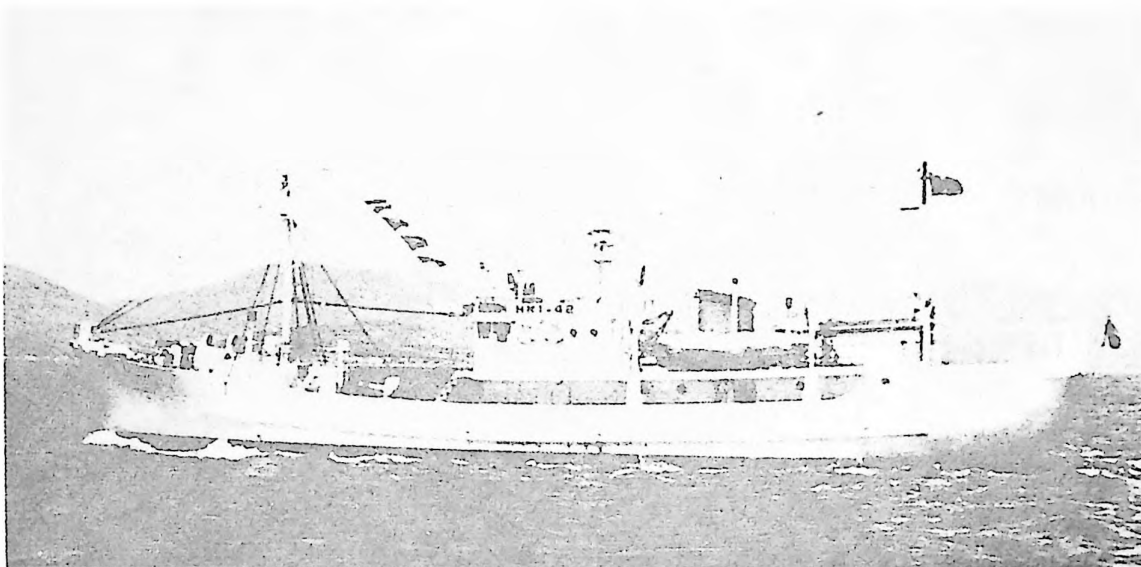
## **TYPE OF OBSERVATIONS**

BT, GEK, etc.

## **REMARKS**

None.

# HOKUSEI MARU



TYPE: Steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1957	112'	22'	11'		221.6	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
9.5	11.0		9,000 miles	45 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
21	22 (mostly students)

## **AFFILIATION**

Faculty of Fisheries, Hokkaido University, Hakodate, Hokkaido, Japan.

## **PROPULSION**

Hanshin-Nainenki diesel, 450 HP, with controllable pitch propeller.  
Fuel oil capacity 80.32 tons.

## **ELECTRICAL POWER**

Has 65 HP diesel generator and a 40 KVA Helshaw steering engine.  
Electric current is 110V AC and 220V AC.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Tokyo-Keiki, MR-30 radar, 30 mi. range and Tokyo-Keiki loran.

Communication - Nihon-Denki radio, 250W, 75W.

Echosounders - Kaijo Denki, 45 KC, 5,900 ft. range and Kaijo Denki, type 103, 200 KC, 1,940 ft. range.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Electric hydrographic winch, 3 HP with 4,920 ft. cable; Izui electric line hauler, 10 HP with 173,840 ft. cable; and a 10 HP net hauler or power block with 11,709 ft. cable.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

None

## **HABITABILITY**

Fresh water capacity 27.8 tons.



#### OTHER FEATURES

Has 72 cu. ft. fish hold.

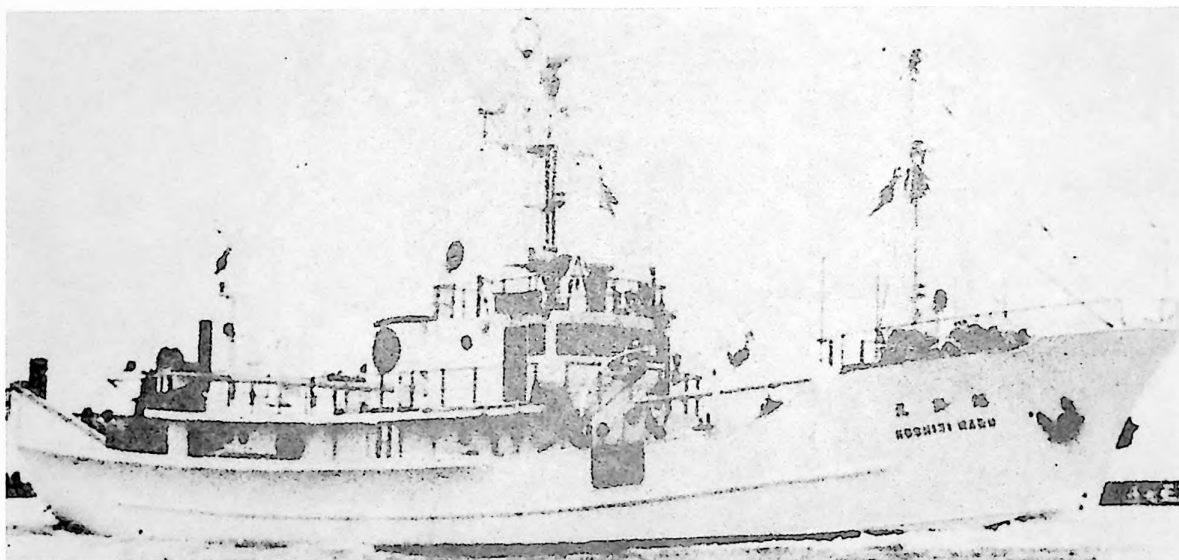
#### TYPE OF OBSERVATIONS

Exploratory fishing, fisheries training, and oceanographic and biological observations.

#### REMARKS

Generally works in the north and equatorial Pacific and the Okhotsk Sea.

# KOSHIJI MARU



TYPE: Steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1960	90.2'	18.7'	8.5'			

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
10.0	10.7		4,200 miles	10-15 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
28	2

## **AFFILIATION**

Niigata Prefectural Fishery Experimentation Station, Niigata City.

## **PROPULSION**

Diesel, 420 HP at 385 r.p.m. with single fixed-blade propeller.  
Carries 30 tons of fuel oil.

## **ELECTRICAL POWER**

Has 220V AC from two motor-type generators, 42 HP and 32 HP.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Radar, Anritu Dempa K.K. AR25-A type, 25 mi. range; loran, Tokyo Keiki K.K. Speri, 1,400 mi. range.

Communication - Transistor radio.

Echosounders - Sanken K.K. NTLB 3,000, range 0-300 and 0-3,000 m.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Two electric BT winches with 300 and 1,000 m. of cable; one electric line hauler and one electric net hauler.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

None.

## **HABITABILITY**

Fresh water storage 8.78 tons.

## **OTHER FEATURES**

Portable refrigerator.

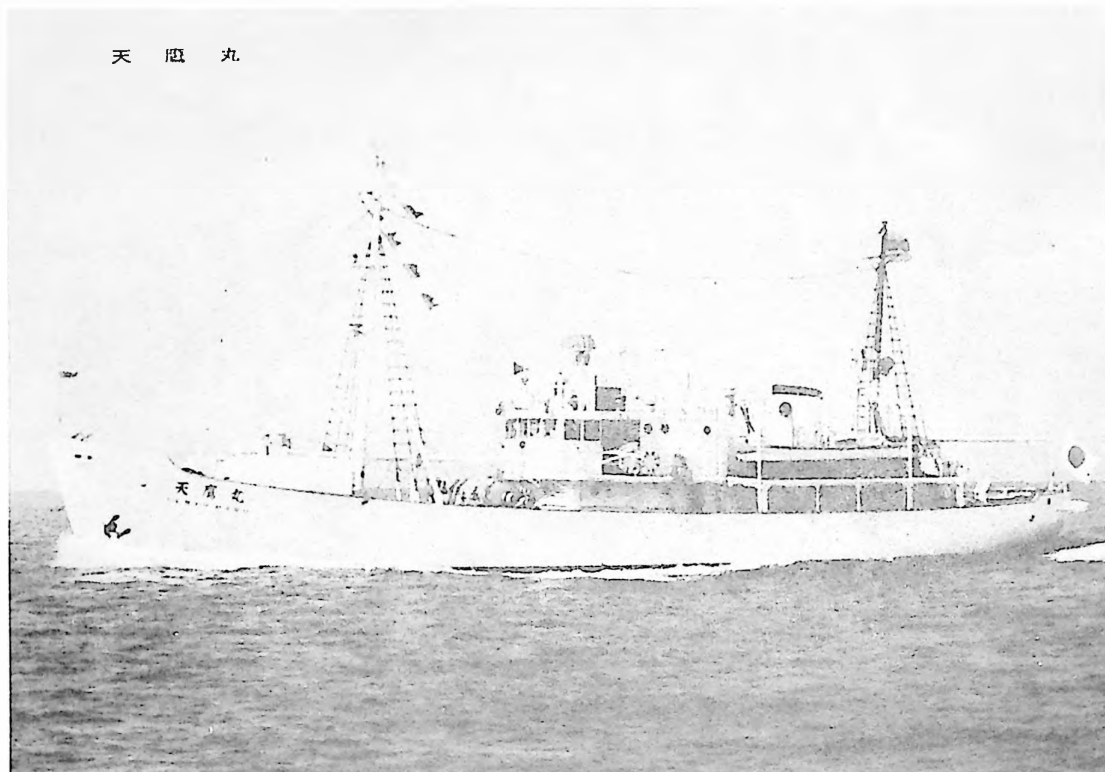
## **TYPE OF OBSERVATIONS**

Oceanographic and biological observations; fisheries research, training and protection.

## **REMARKS**

Generally works in the Sea of Japan. Vessel is very seaworthy.

# TENYO MARU



**TYPE:** Training and Research Ship, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1949	37.8 m.	3.6 m.			214.6	67.7

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
10.0	11.0			

## COMPLEMENT

CREW	SCIENTIFIC STAFF
22	34 mostly cadets

**AFFILIATION**

University of Fisheries, Shimonoseki.

**PROPULSION**

Diesel engine, 430 BHP at 290 r.p.m. Fuel oil tank capacity 75 cu. m.

**ELECTRICAL POWER**

Has two 45 KW generators.

**NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Radar, loran, direction finder, etc.

**HYDROGRAPHIC WINCHES AND EQUIPMENT**

Hydrographic winches with 3,000 m. and 1,500 m. of wire.

**ACOUSTICAL CHARACTERISTICS**

No information.

**LABORATORIES**

No information.

**HABITABILITY**

Fresh water tank capacity 54.5 cu. m.

**OTHER FEATURES**

Fish hold capacity 8.0 cu. m.

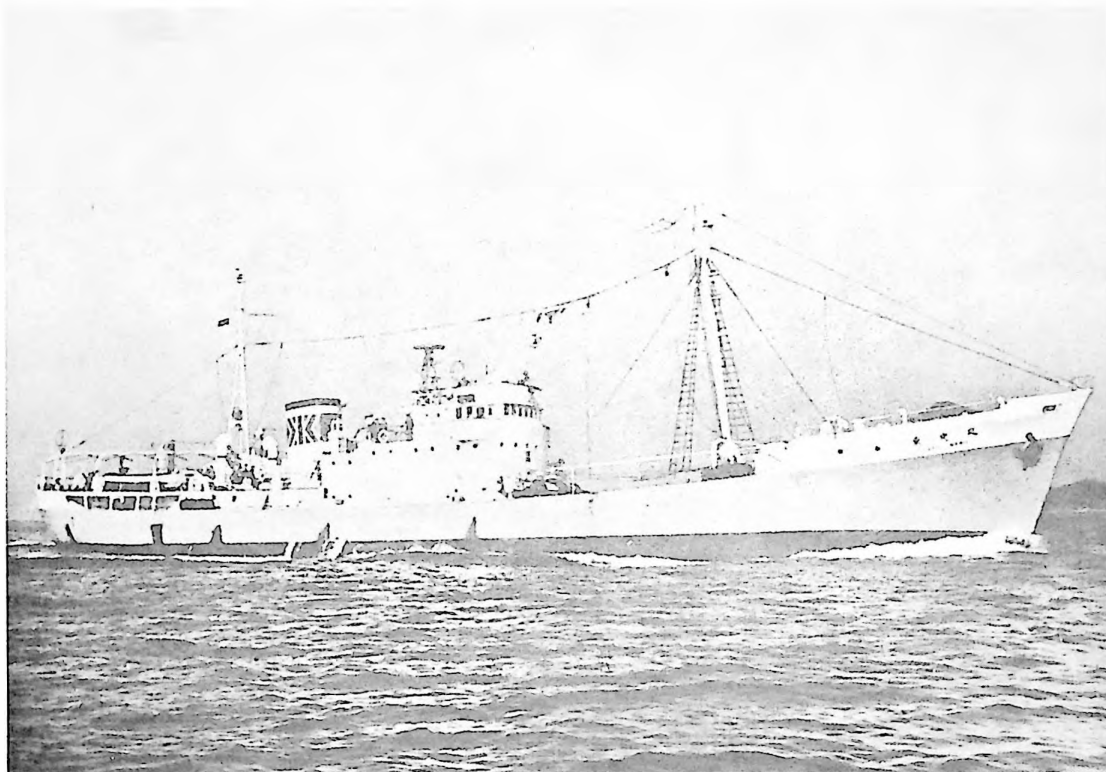
**TYPE OF OBSERVATIONS**

Oceanographic

**REMARKS**

None

# TOKO MARU



**TYPE:** Fisheries Research and Inspection Vessel, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1954	63.0 m.	10.7 m.	5.4 m.		1,098	527.7

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
13	14.5		15,000 miles	

## COMPLEMENT

CREW	SCIENTIFIC STAFF
35	up to 18 (mostly officers)

## **AFFILIATION**

Fisheries Agency.

## **PROPULSION**

Diesel engine, 2,300 BHP at 200 r.p.m. Fuel oil tank capacity 470 cu. m.

## **ELECTRICAL POWER**

No information, but believed to have sufficient capability to perform any oceanographic operation.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Radar, loran, gyrocompass, direction finder, course recorder, etc.

Communication - Short wave 500W and medium short wave 250W transmitters. Superheterodyne, short, medium and long wave receiver. Radio-telephone.

Echosounders - Kaijo Denki, range 1,800 m. and deep sea type, range 4,000 m.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has 90 HP trawl winch and other equipment for oceanographic observation.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

No information.

## **HABITABILITY**

Fresh water tank capacity 205 cu. m.

### OTHER FEATURES

Fish hold capacity 430 cu.m.

### TYPE OF OBSERVATIONS

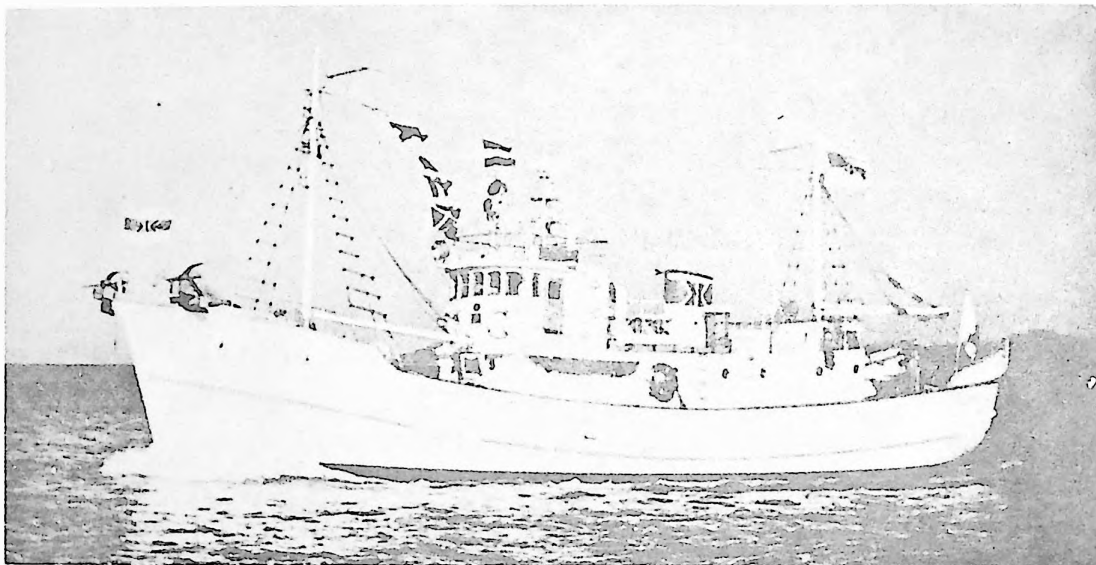
Oceanographic and fisheries research.

### REMARKS

None



# WAKATAKA MARU



TYPE: Wood hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1959	85.9'	17.4'	7.9'		83.8	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
8.9	9.3		3,000 miles	10 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
14	4

## **AFFILIATION**

Tohoku Regional Fisheries Research Laboratory.

## **PROPULSION**

Hanshin Co. diesel, 250 HP at 390 r.p.m. with single fixed-blade propeller. Carries 10.86 tons of fuel oil.

## **ELECTRICAL POWER**

Has 105V DC from Shin-Mitsubishi engine generator, 25 HP/15 KW.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Tokyo Keiki/BR-15 radar, 40 mile range; Kodan Seisaku/KS-335 loran, 870 mile range.

Communication - JRC radio, 75W, 50W (SSB).

Echosounders - Furono echosounder, 14 KC, 1,600 m. range.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Tsurumi Seiki electric winch with 9,840 ft. of cable; Goriki Ship-yard trawl winch; Izui Iron Works electric line hauler.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Total laboratory space, 71.11 sq. ft.

## **HABITABILITY**

Carries 4.14 tons of fresh water.

## **OTHER FEATURES**

Has refrigeration equipment, Mitsuibishi-Nisshin Kogyo/F-12.

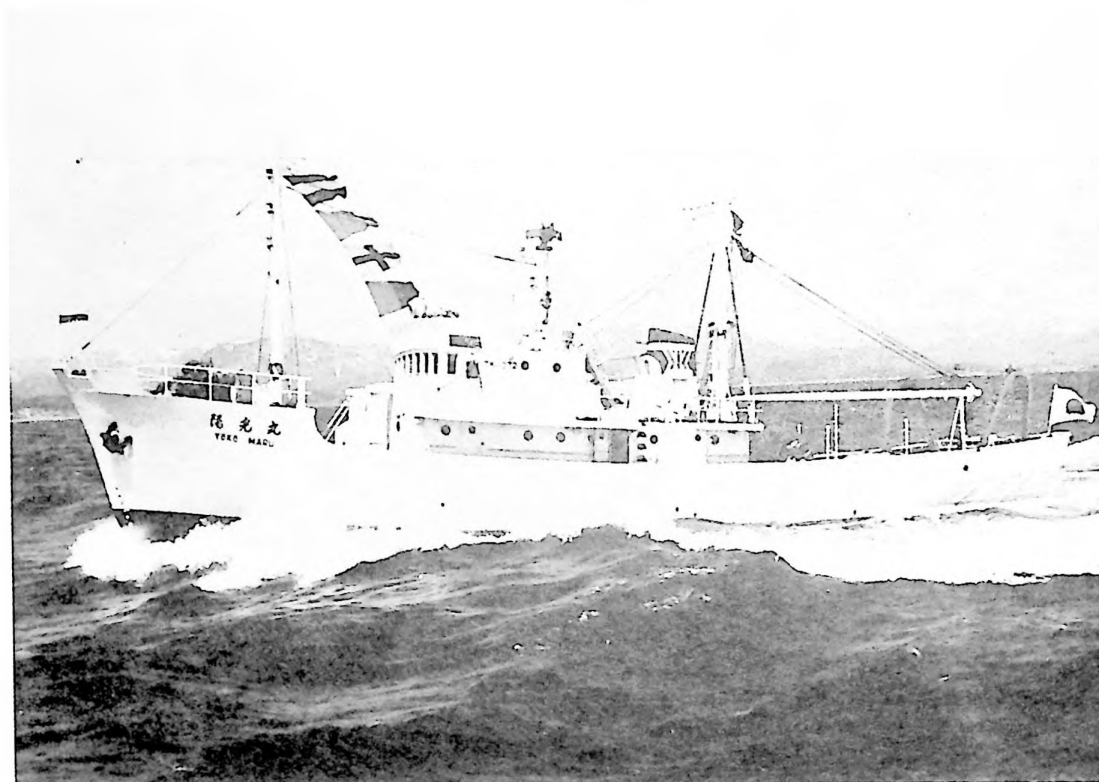
## **TYPE OF OBSERVATIONS**

BT, water sampling, bottom grabs, biological observations, and exploratory fishing.

## **REMARKS**

Generally works in the coastal area north of Japan.

# YOKO MARU



**TYPE:** Fisheries Research and Inspection Vessel, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1961	29.8 m.	7.3 m.	3.3 m.		213.1	61.0

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
9.5	11.0		6,150 miles	20 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
35 (total)	

## **AFFILIATION**

Tokai Regional Fisheries Research Laboratory, Fisheries Agency.

## **PROPULSION**

AKASAKATETSUKO MK 6S diesel engine, 550 BHP with supercharger, single fixed-blade propeller. Fuel oil capacity 66.0 cu. m.

## **ELECTRICAL POWER**

Has 6 LDL x 1 and 3 LDL x 1 generators capable of producing 35 KVA, 225V AC.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Communication - Radios, A' 250W and SSB 50W.

Echosounders - One Kaijo Denki

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has one hydraulic Fukushima trawl winch (3 1/2 tons x 35 m/min.), one oceanographic winch (Tsurumi Seiki TS2/electric sounding machine) with 3,000 m. wire.

## **ACOUSTICAL CHARACTERISTICS**

No information

## **LABORATORIES**

Has space available

## **HABITABILITY**

Fresh water tank capacity 34.1 cu. m.

## **OTHER FEATURES**

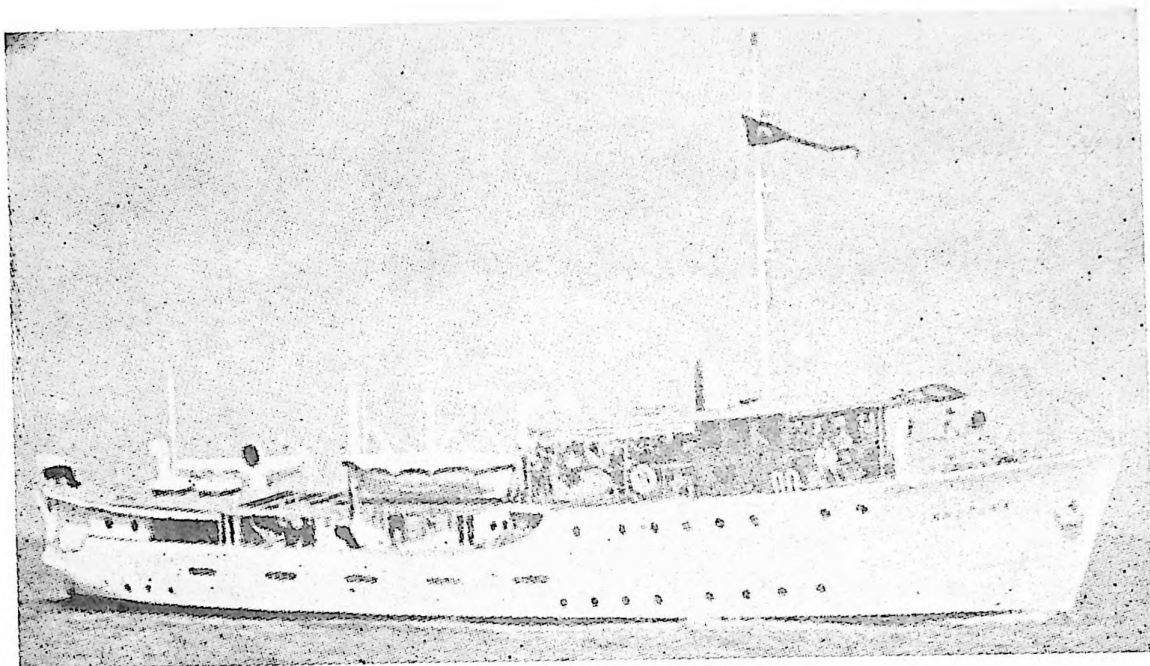
Fish hold capacity 19.0 cu. m.

## **TYPE OF OBSERVATIONS**

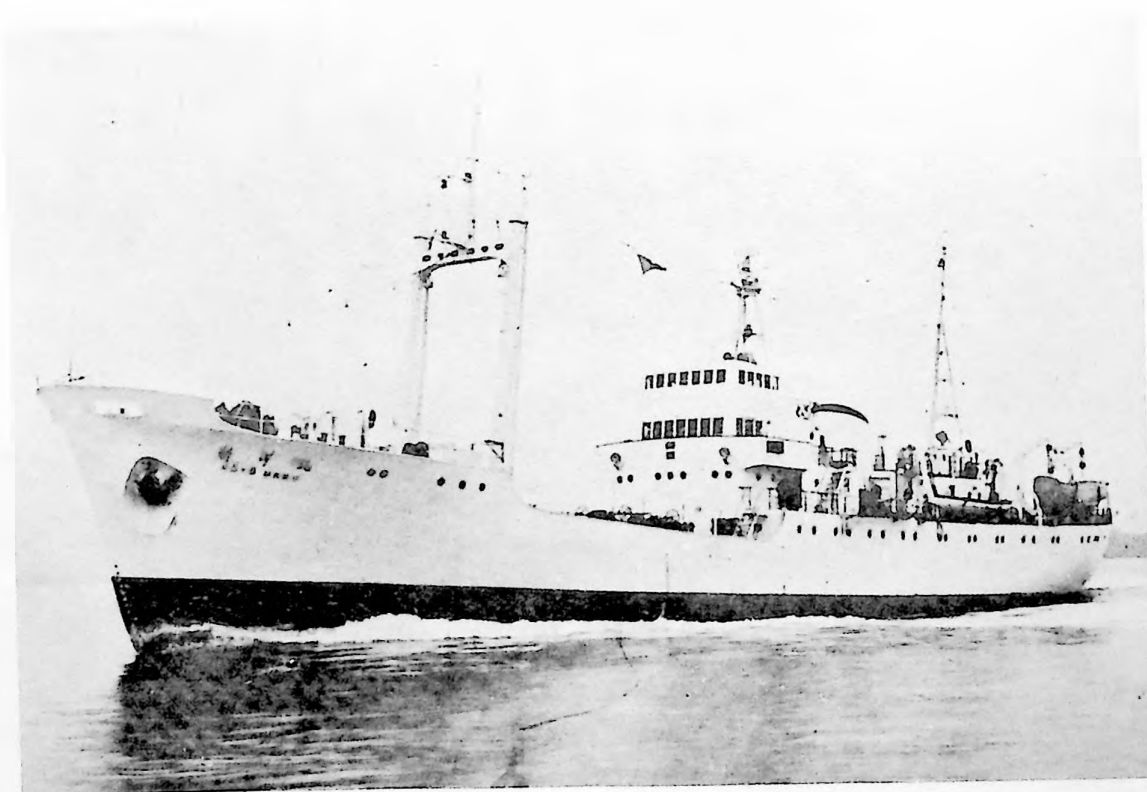
Oceanographic, biological, and fisheries research.

## **REMARKS**

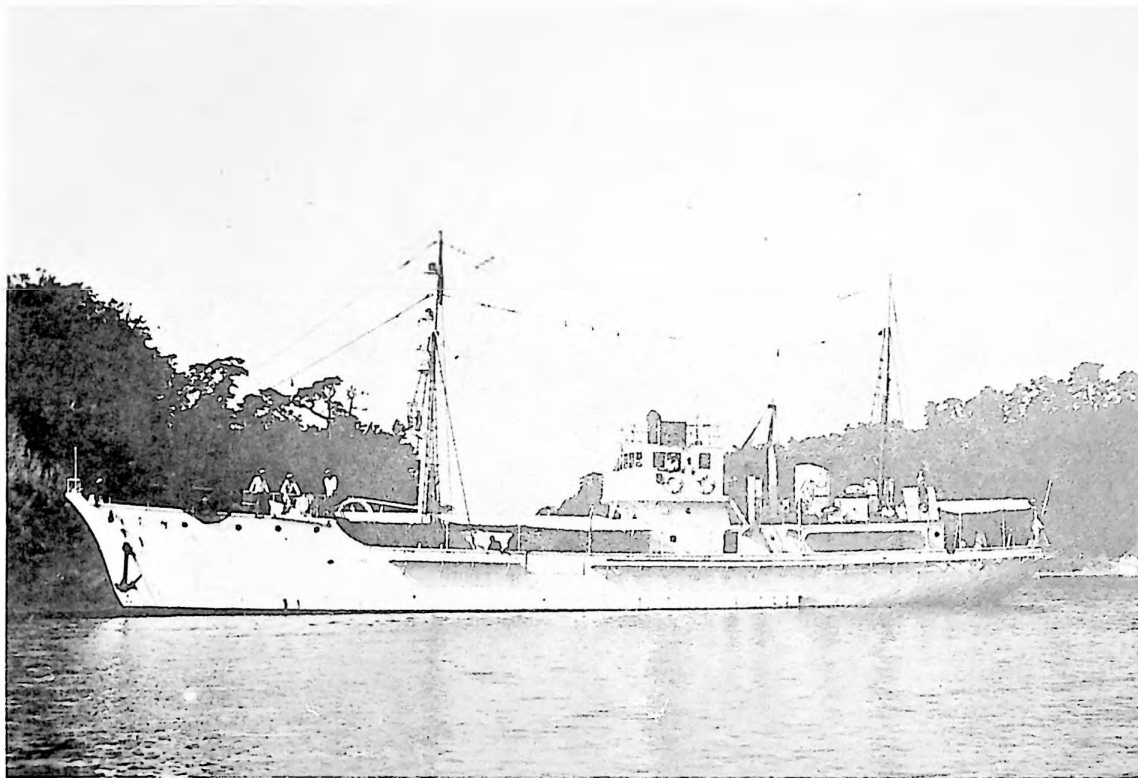
None



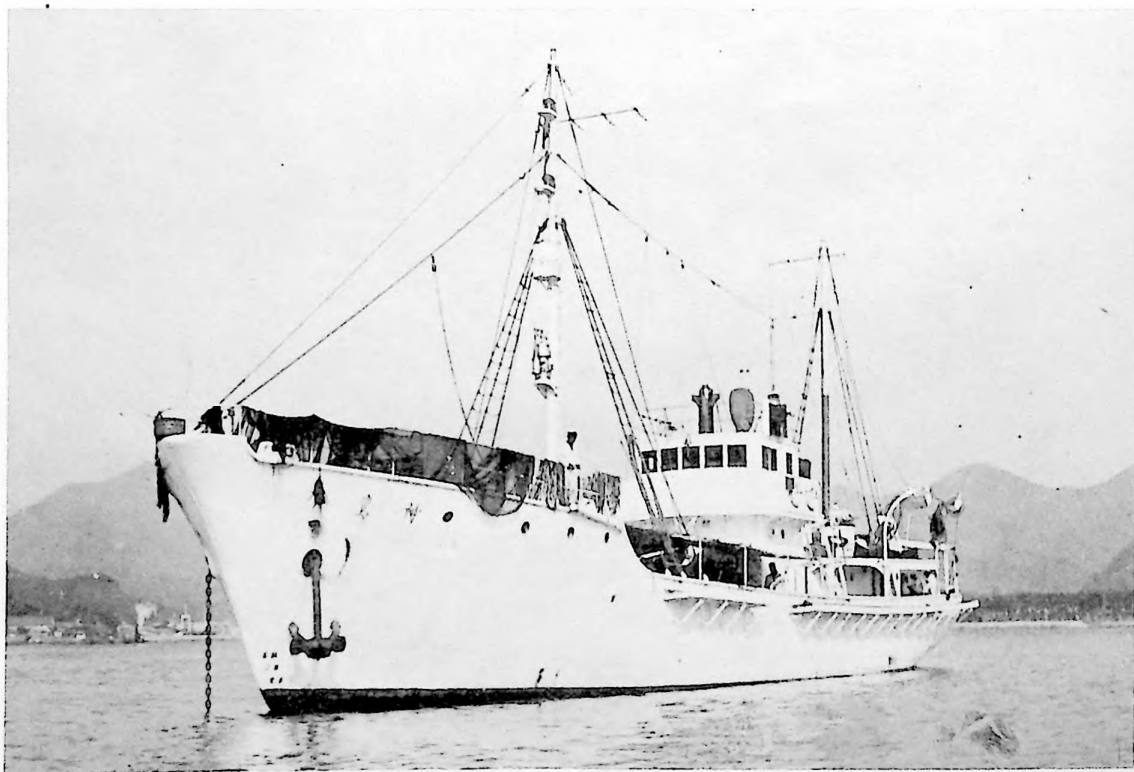
SAMUDERA, paste on page 30.1



KOYO MARU, paste on page 36.11



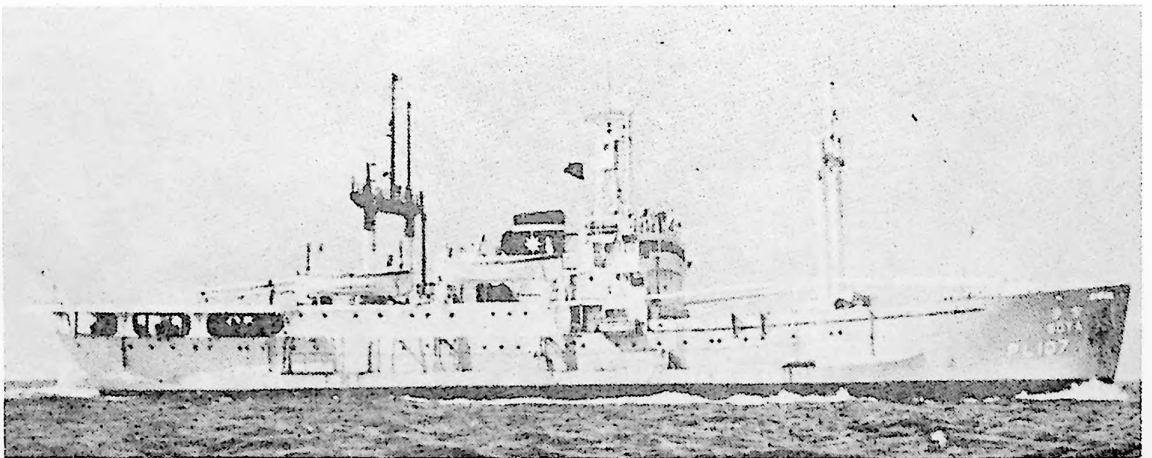
SHINYO MARU, paste on page 36.25



SHINYO MARU, paste on lower half of page 36.27



SHOYO MARU, paste on page 36.28



SOYA, paste on lower half of page 36.36

# MOROCCO

## SECTION 43



# EL MORCHID

NO PHOTO AVAILABLE

TYPE: Iron hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1956	84'	20'	9.1' (aft)	138 tons (full)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
9			600 miles	

## COMPLEMENT

CREW	SCIENTIFIC STAFF
10	3

## **AFFILIATION**

Institut des Peches Maritimes du Maroc, Casablanca.

## **PROPULSION**

B & W diesel motor, 2-cycles, 240 HP at 375 r.p.m. Single reversible and controllable pitch blade. Diesel oil tank capacity 13.5 tons.

## **ELECTRICAL POWER**

Ship generates 56 KW. Has two generators: one 33 KW, 110V DC and one 23 KW, 110V DC.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - No information.

Communication - One transreceiver.

Echosounders - One vertical sounder (Sadir-Carpentier) with 600 m. range. Registers on dielectric paper. Equipped for fish detection. Also has one vertical and horizontal (Simrad) sounder.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One hand operated windlass with two drums, each containing 100 m. of chain. One fishing windlass, 23 HP, electric. Two Warlūzel windlasses with 500 m. of cable.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

None.

## **HABITABILITY**

Carries 9.9 tons of fresh water. No other information.

#### **OTHER FEATURES**

Has 38 cu. m. refrigerated hold. Two rolling keels on hull.

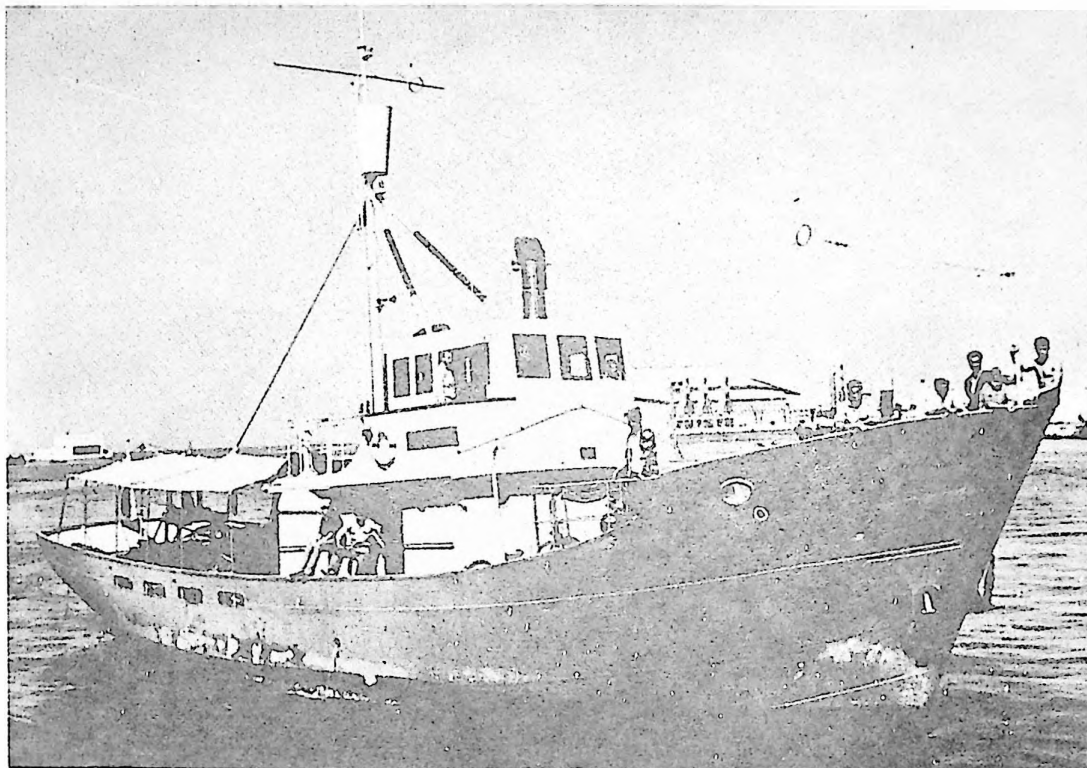
#### **TYPE OF OBSERVATIONS**

Fisheries research, mainly on different fishing methods experimentation. Is equipped to perform classical oceanographic observations.

#### **REMARKS**

None.

# EL MORCHID



**TYPE:** Steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1956	80.4'	20'	10'	138 tons (full)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
7	9		600 miles	10 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
10	3

## **AFFILIATION**

Institut des Peches Maritimes du Maroc, Casablanca.

## **PROPULSION**

B & W diesel motor, 2-cycle, 240 HP at 375 r.p.m. Single reversible and controllable pitch blade propeller. Diesel oil tank capacity 13.5 tons.

## **ELECTRICAL POWER**

Ship generates 56 KW. Has two generators: one 33 KW, 110V DC and one 23 KW, 110V DC. Also has 24V DC.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - No information.

Communication - One transreceiver, SFR, 25W.

Echosounders - One vertical sounder (Sadir-Carpentier) with 600 m. range. Registers on dielectric paper. Equipped for fish detection. One vertical and horizontal (Simrad) sounder with 600 m. range. Also has asdic.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One hand operated windlass with two drums, each containing 100 m. of chain. One fishing windlass, 23 HP, electric. Two Warluzel windlasses with 500 m. of cable. One Mecaboiler electric winch with 2,500 m. of cable. One net hauler and one power block.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

None.

## **HABITABILITY**

Carries 9.9 tons of fresh water. General comfort insufficient.

### **OTHER FEATURES**

Has 38 cu. m. refrigerated hold. Two rolling keels on hull.

### **TYPE OF OBSERVATIONS**

BT, water sampling, currents, underway bottom sampling, biological observations, exploratory fishing, fisheries protection and hydrographic survey.

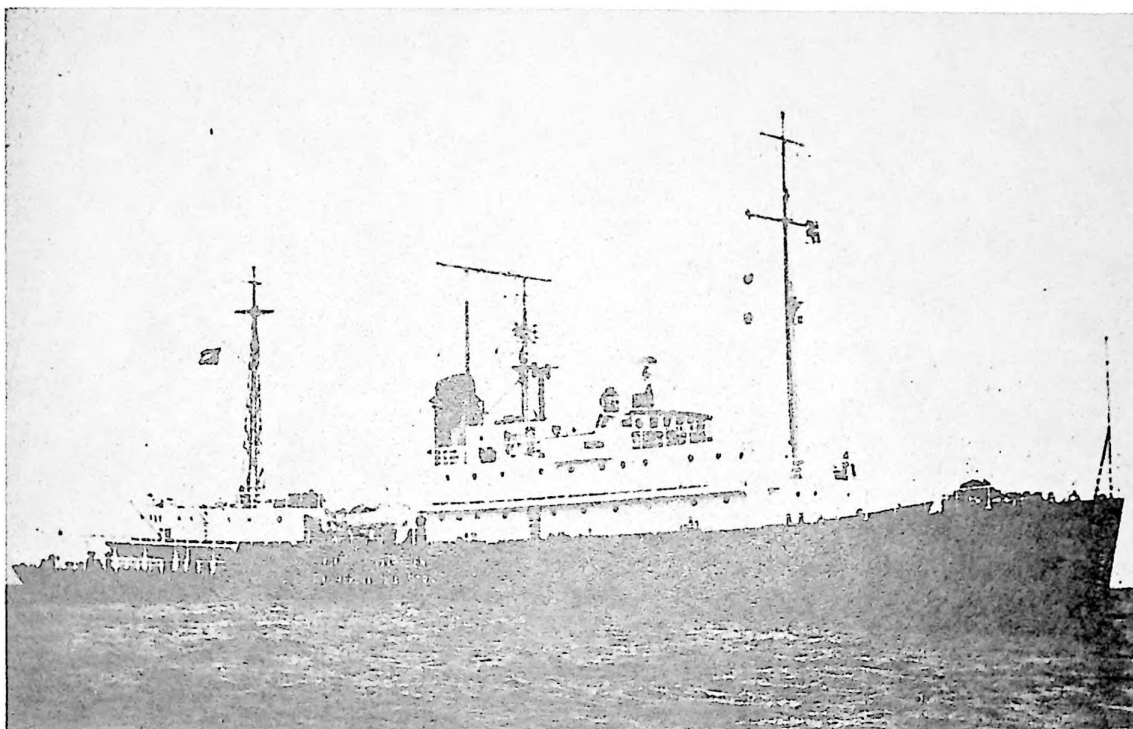
### **REMARKS**

Can hold power in the sea, but ship is not very sea kindly.

# NETHERLANDS

## SECTION 44

# CIRRUS



**TYPE:** Converted Frigate, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1943	287'	37.5'	13'2"	1,930 tons		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
10	20		6,000 miles	

## COMPLEMENT

CREW	SCIENTIFIC STAFF
44	19



## **AFFILIATION**

Ocean Weather Ship for Department of Civil Aviation, Civil Aeronautical Service.

## **PROPULSION**

Has two four-cylinder triple expansion engines, twin screw, 550 IHP. Uses fuel oil.

## **ELECTRICAL POWER**

Currents available: 440V AC, 90 KVA, 60-cycle, 3-phase (2 sources) and 120V DC, 25 KW (2 sources). Constant frequency current available.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Loran (Sperry Mod. DBE), direction finder (Marconi 758E Lodestone), and radar (one Navy type SA2 and one Sperry MK3).

Communication - Type TBL, 24 MC-300 KC, CW and voice; Type T-77 (Beacon trans.) 200-600 KC, CW; Type LVB6, 1.5-20 MC, 4 CW and two voice; Type S.F.Z. 341/06, 110-130 MC, voice; distress transmitter type T 1154/R1155, 500 KC, CW; Type CR 100, 30 MC-200 KC; Type RBL, long wave, 15-600 KC; Type AR88, 500 KC-30 MC; and Type Plessey, 110-130 MC.

Echosounder - Bludworth NJ 8.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One electric hydrographic winch with 15,000' of 5/32" steel cable. One electric BT winch with 1,200' of 3/32" wire. One steam operated anchoring winch with 105 fms. of 1-5/8" cable.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Has oceanographic laboratory and meteorological laboratory equipped for radiosonde ascents.

**HABITABILITY**

No information.

**OTHER FEATURES**

No information.

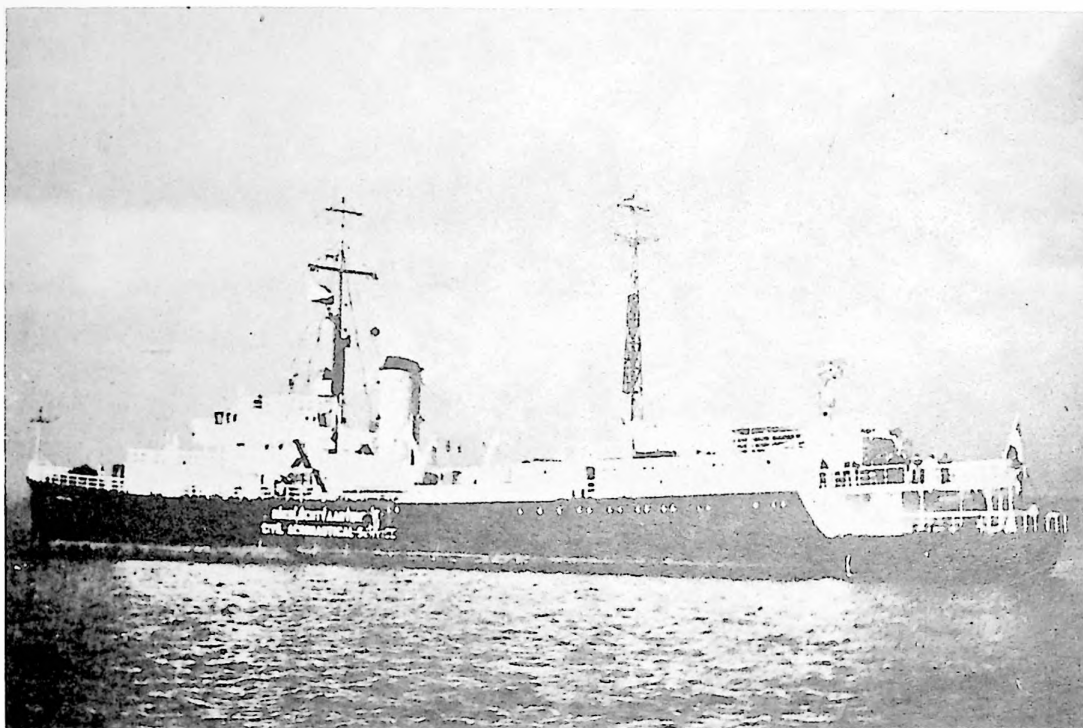
**TYPE OF OBSERVATIONS**

Oceanographic and meteorological observations.

**REMARKS**

None.

# CUMULUS



**TYPE:** Converted Frigate, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1943	287'	37.5'	11'5"	1,819 tons		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
10	20		6,000 miles	

## COMPLEMENT

CREW	SCIENTIFIC STAFF
44	19

## **AFFILIATION**

Ocean Weather Ship for Department of Civil Aviation, Civil Aeronautical Service.

## **PROPULSION**

Two four-cylinder triple expansion engines, twin screw, 5,500 IHP. Uses fuel oil.

## **ELECTRICAL POWER**

Currents available: 440V AC, 90 KVA, 60-cycle, 3-phase (2 sources). 120V DC, 25 KW (2 sources). Constant frequency current available.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Loran (Sperry Mod. DBE), direction finder (Marconi 785E Lodestone), and radar (one Navy type SA 2 and one Sperry MK 3).

Communication - Type TBL, 24 MC-300 KC, CW and voice; Type T-77 (Beacon trans.) 200-600 KC CW; Type LVB7, 1.5-20 MC, 5 CW and two voice; Type S.F.Z. 341/06, 110-130 MC, voice; distress transmitter type T 1154/R1155, 500 KC CW; Type CR 100, 30 MC-200 KC; Type RBL, long wave, 15-600 KC; Type AR88, 500 KC-30 MC; and Type Plessey, 110-130 MC.

Echosounder - Bludworth NJ 8.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One electric hydrographic winch with 1,500' of 5/32" steel cable. One electric BT winch with 1,200' of 3/32" wire. One steam operated anchoring winch with 120 fms. of 1-5/8" cable.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Has oceanographic laboratory and meteorological laboratory equipped for radiosonde ascents.

## **HABITABILITY**

No information.

**OTHER FEATURES**

No information.

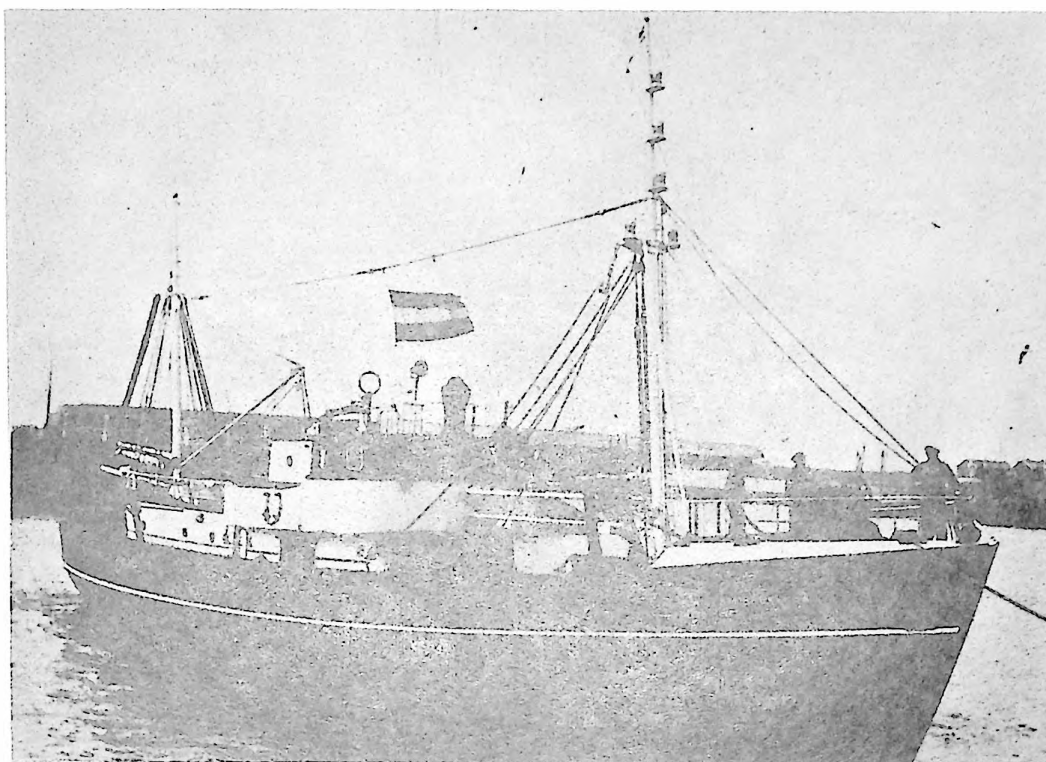
**TYPE OF OBSERVATIONS**

Oceanographic and meteorological observations.

**REMARKS**

None.

# WILLEM BEUKELSZ



**TYPE:** Steel Trawler, specially designed for fisheries research.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1956	115'3"	23'1"	11'4"		205	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
9	9.7		3,700 miles	

## COMPLEMENT

CREW	SCIENTIFIC STAFF
12	6

## **AFFILIATION**

Fisheries Research Vessel of the Governmental Fisheries Research Laboratory.

## **PROPULSION**

Diesel-electric, single screw. Uses diesel oil.

## **ELECTRICAL POWER**

Currents available for scientific work: 220V AC, 0.75 KVA, 50-cycle; 220V DC, 18 + 18 + 50 KW; and 220V DC, 11.5 KW. Constant frequency current available.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Decca navigator and track plotter.

Communication - Transmitters - RCA type 8012, 220V, voice, frequency 4 MC-200 KC. Receivers - Type RH 5746 and RH 5746 DT.

Echosounders - Two Kelvin-Hughes MS29F, one Elac Atair, one Elac Fischlupe, one Elac Flash Indicator, one Elac Lodar, and one Elac Net Gauge.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has one hydraulic hydrographic winch with 1,000' of 5/32" steel wire. One electric trawl winch with three drums. One hand operated anchoring winch with 540' of 1" cable.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Has one laboratory on main deck with working space for five persons.

## **HABITABILITY**

No information.

**OTHER FEATURES**

No information.

**TYPE OF OBSERVATIONS**

Fish samples, plankton, and hydrography.

**REMARKS**

None.



# **NEW ZEALAND**

## **SECTION 45**

# LACHLAN

NO PHOTO AVAILABLE

**TYPE:** Steel hulled, Australian RIVER Class Frigate.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1944	300'	37'	14'	1,490 tons		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
13	15	2	3,800 miles	18 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
140	8

## **AFFILIATION**

Royal New Zealand Navy.

## **PROPULSION**

Triple expansion, steam reciprocating engine, twin fixed-blade screws, 5,500 IHP. Fuel oil capacity is 500 tons.

## **ELECTRICAL POWER**

Has 230V AC, 10 KVA, 50-cycle and 230V DC from two 70 KW and one 60 KW generators. Also available 240V AC. Extra generator can be switched in for station work.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass, Chernikeef log, direction finder, radar, and asdic.

Communication - UHF, MF, and W/T long range to cover most frequencies.

Echosounders - EDO AN/UQN-1B Model 185, and Admiralty type 185. Can record up to 6,000 fms. with about 2% accuracy.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Oceanographic winch (electric) with 10,000 m. of wire 7-stage (resistance type). Two BT winches: electric clutch brake (sounding machine type) with 600 m. of 4 mm. wire. Steam winch with 3,000 m. of 4 mm. wire for plankton hauls and 6,000 m. of 1/2" wire for coring.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Two laboratories: for physics, hydrology, zooplankton, phytoplankton (microscope cabinets), marine productivity, and biochemistry. Air-conditioned, hot and cold fresh water, cold salt water, gas, air, and vacuum lines. Also has plotting room.

#### **HABITABILITY.**

Capable of operating in all ice-free waters. Has a 50-ton fresh water capacity with a distilling plant; no salt water showers.

#### **OTHER FEATURES**

Can make observations up to Sea State 5 or 6.

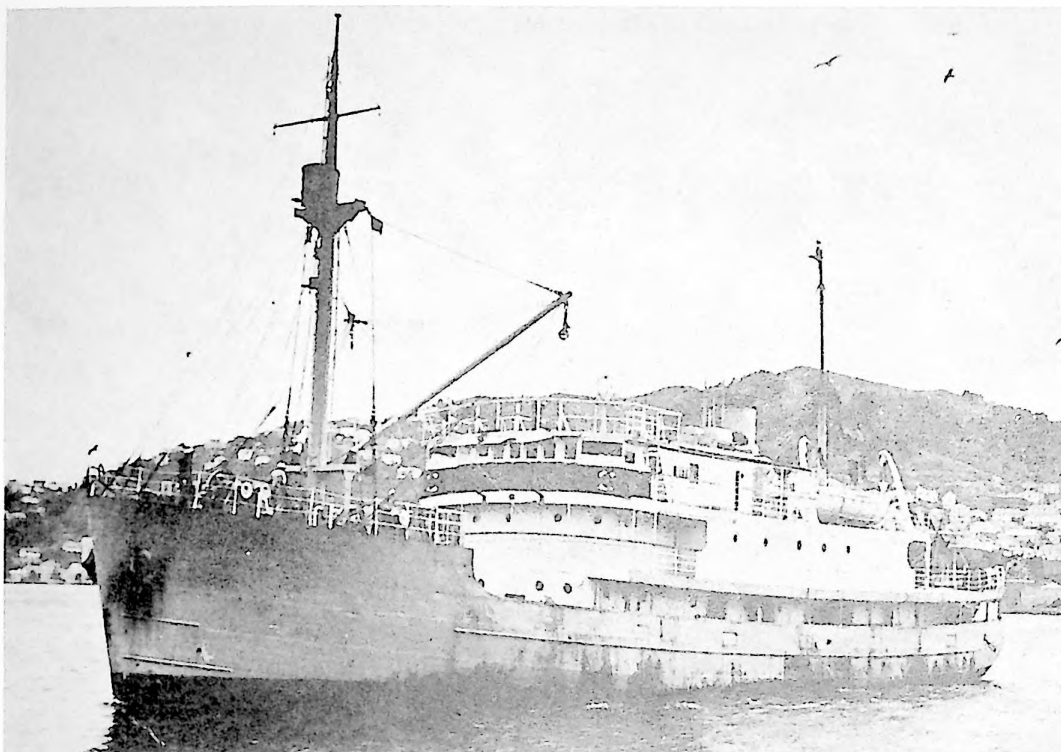
#### **TYPE OF OBSERVATIONS**

Hydrological, physical, and some biological, BT, net tows, coring, dredging, grab samples.

#### **REMARKS**

Specifications for this ship were taken from those of the GASCOYNE and DIAMANTINA, of the same class. However, this ship was recently refitted and new equipment may now be on board. The Lachlan is on loan to the Royal New Zealand Navy from the Royal Australian Navy for hydrographic and oceanographic research.

# VITI



**TYPE:** Refrigerated, steel, Cargo-Ship.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1940	167.5'	31.5'	14.5'	670.6 tons (light)	701	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
10	12		7,000 miles	30 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
17	6

## **AFFILIATION**

New Zealand Oceanographic Institute, Department of Scientific and Industrial Research.

## **PROPULSION**

Sulzer diesel motors, twin screw, 1,100 HP. Carries 95 tons of diesel oil. Uses about 3 tons/day at 285 r.p.m.

## **ELECTRICAL POWER**

Has 220V DC ship's supply. Has 230V AC, 50-cycle laboratory supply.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Magnetic compass and ship's log.

Communication - Bendix aircraft transmitter. Locally made short wave receiver. Frequencies usually used, 2262 KC and 2282 KC.

Echosounders - Kelvin-Hughes MS26K and Elac Atair 560 fms.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One hydraulic winch with 20,000' of 7/32" wire. One T. S. Type II, 3 HP. BT winch (Japanese) with 10,000' of wire. One hydraulic coring winch with 2,500' of 3/8" wire.

## **ACOUSTICAL CHARACTERISTICS**

Ship cannot be put in noiseless condition.

## **LABORATORIES**

One laboratory aft (60 sq. ft.), equipped as required.

## **HABITABILITY**

Built for tropical service. Carries 79.2 tons fresh water; no distillation apparatus.

## **OTHER FEATURES**

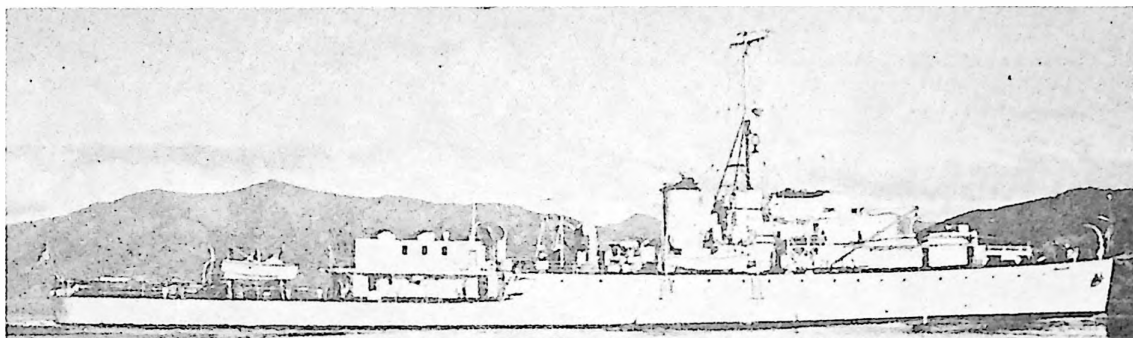
Equipped with underwater camera and scientific freezer space.

## TYPE OF OBSERVATIONS

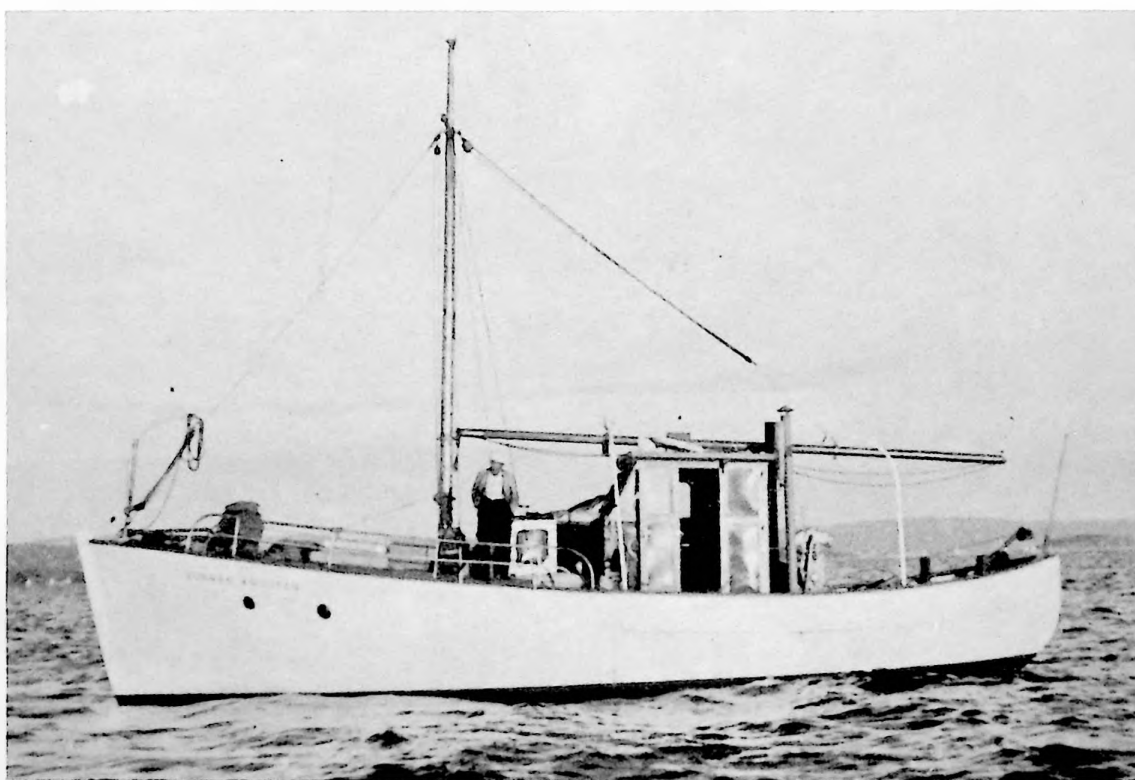
Primarily used for oceanographic research. Hydrographic casts, bottom sampling, coring and dredging, extraction of large volumes of water, underway observations (soundings, BT), and plankton collection.

## REMARKS

Women scientists could be accommodated.



LACHLAN, paste on page 45.1



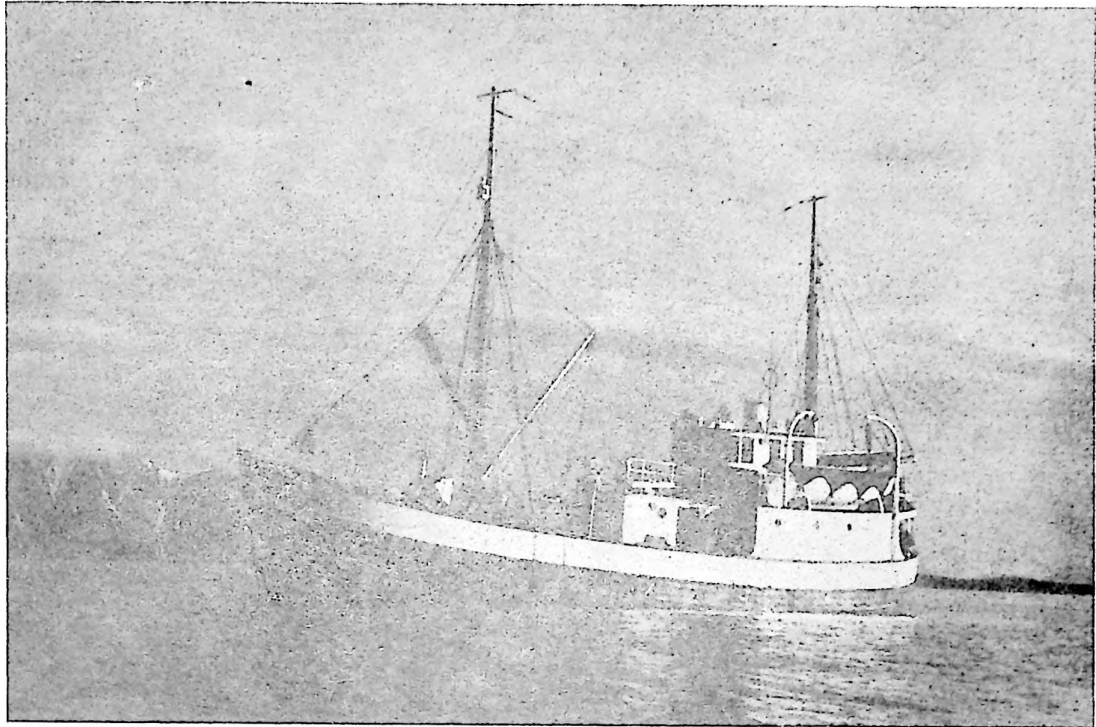
GUNNAR KNUDSEN, paste on page 46.13



# NORWAY

SECTION 46

# ASTERIAS



**TYPE:** Wooden hulled Trawler.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
	73'	21'	10.5'	61.3 tons		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
			1,700 miles	

## COMPLEMENT

CREW	SCIENTIFIC STAFF
4 (Total)	

## **AFFILIATION**

Tromsø Museum.

## **PROPULSION**

Semi-diesel.

## **ELECTRICAL POWER**

Has 24V AC, 2-phase, no constant frequency current.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - No information.

Communication - Simrad transmitter, (500 miles).

Echosounders - Simrad Fish echosounder (0-600 fms.), Atlas 58 bottom echosounder (0-600 fms.), and Simrad asdic (0-1,500 m.).

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has one hydraulic hydrographic winch (1,000 kg. capacity) with 12,000' of 4 mm. wire. One hydraulic coring winch (3,000 kg. capacity) with 6,000' of 12 mm. wire.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Has two laboratories (4 x 4 m. and 1-1/2 x 5 m.) with space for 4 workers.

## **HABITABILITY**

No information.

## **OTHER FEATURES**

None.

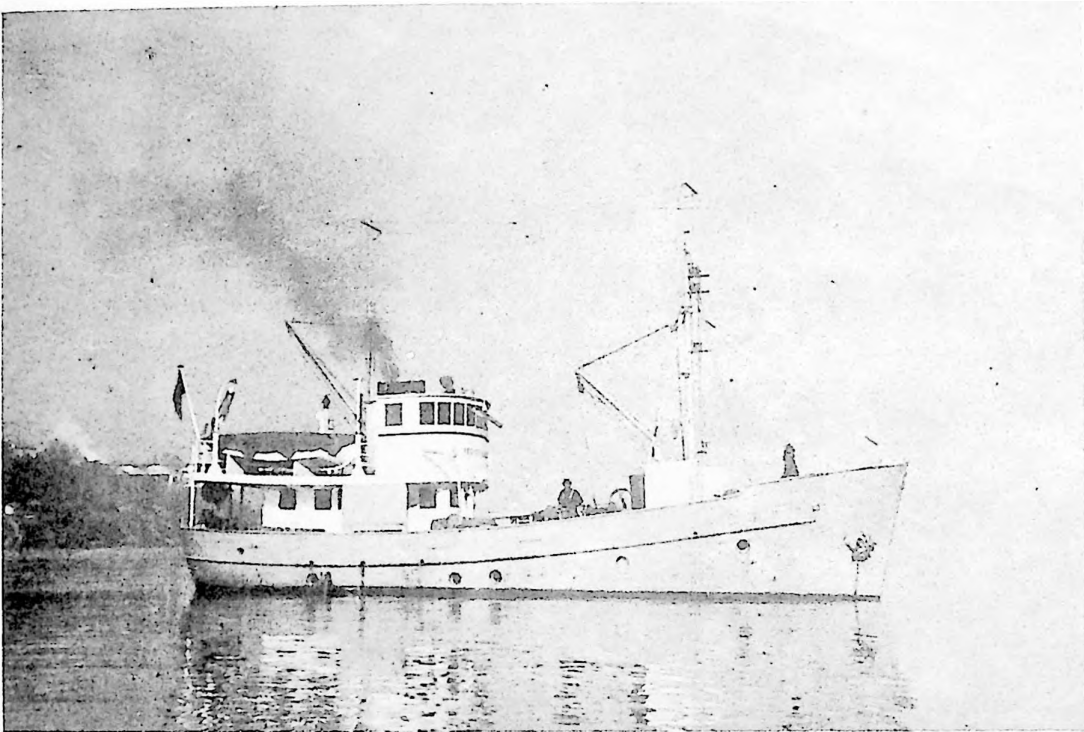
### **TYPE OF OBSERVATIONS**

Fisheries, bottom fauna, and classical oceanographic observations.

### **REMARKS**

Operates in northern Norwegian waters, Barents Sea, and around Spitsbergen to 80° N.

# FRIDTJOF NANSEN



**TYPE:** Steel hulled Trawler.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
	63'1"	17'3"	9'1"		58.2	13.1

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
8.5	10		1,300 miles	

## COMPLEMENT

CREW	SCIENTIFIC STAFF
3 (Total)	

## **AFFILIATION**

Biological Station, University of Bergen.

## **PROPULSION**

Semi-diesel (Union), 100/140 HP.

## **ELECTRICAL POWER**

Has 230V AC, 10 KVA, 50-cycle, 3-phase and 24V DC, 1.5-2.2 KW. Constant frequency current available.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - No information.

Communication - Simrad 550-4, 70W, transmitter and receiver. Transmits at 1600-4300 KC.

Echosounder - Kelvin-Hughes MS21.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One hydraulic hydrographic winch with 2,000 m. of 5 mm. wire. One hydraulic trawl winch with 2,000 m. of 10 mm. wire. Also has a hydraulic cargo winch, a hydraulic capstan for fishing lines, and a hydraulic derrick swing.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

One deck laboratory (4.5 x 1.5 m.) with room for three workers.

## **HABITABILITY**

No information.

## **OTHER FEATURES**

Underwater camera.

## **TYPE OF OBSERVATIONS**

Biological and hydrographical research.

## **REMARKS**

Generally works in the fjords of western Norway.

## G. M. DANNEVIG

NO PHOTO AVAILABLE

**TYPE:** Wooden hull, originally designed and built as a Research Vessel.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1949	65'	18'			56	

### PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
8.5	9.2			12 days

### COMPLEMENT

CREW	SCIENTIFIC STAFF
4	2



## **AFFILIATION**

Flødevigen State Biological Station, Arendel.

## **PROPULSION**

Diesel engine, single screw with controllable pitch, 135-150 HP.  
Uses diesel oil. Sails may be used to some extent.

## **ELECTRICAL POWER**

Ship generates 3 KW. Has 24V DC only.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Magnetic compass, ship log, and Decca.

Communication - Radio-telephone.

Echosounders - Has two echosounders.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One hydraulic hydrographic winch, driven off main engine, with 1,000 m. of 6 mm. wire. Also a larger (3 ton) hydraulic winch for trawling with two drums, each with 600 m. of 3/4" wire.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

One laboratory for hydrographic work and one laboratory for microscopic and chemical analyses.

## **HABITABILITY**

Restricted to work in Norwegian coastal waters. Holds 2.5 tons of fresh water; no distillation apparatus.

## **OTHER FEATURES**

Sails may be used to reduce rolling.

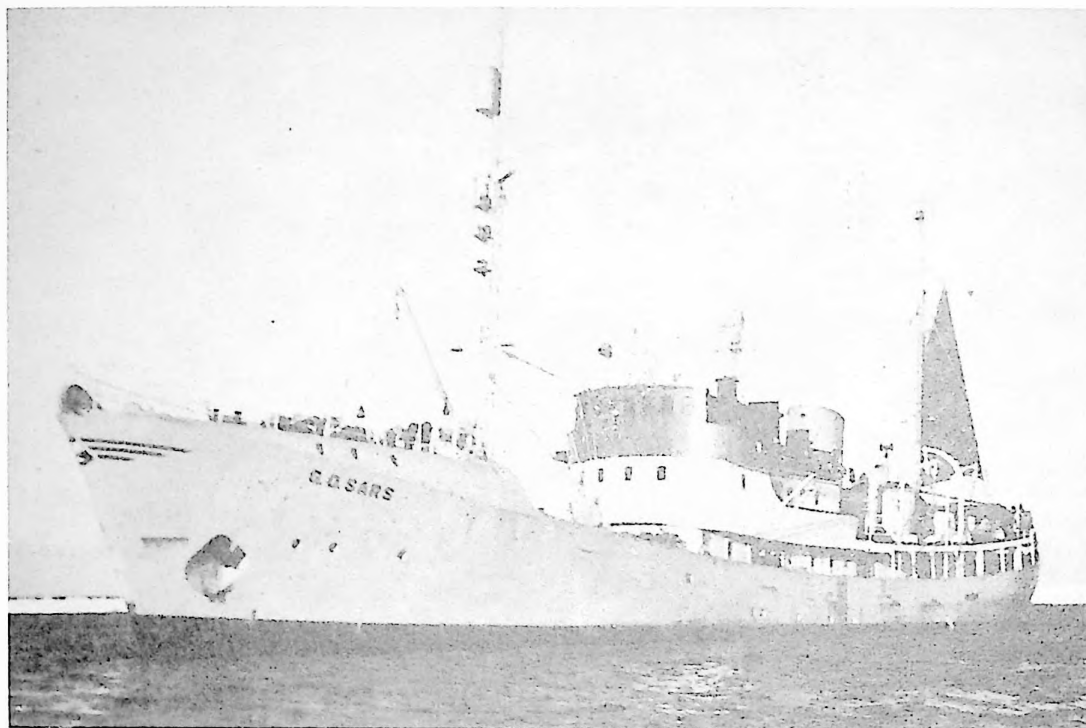
### TYPE OF OBSERVATIONS

General hydrographic work, trawling, dredging, and sounding.

### REMARKS

Designed for fisheries research and named after the founder of the Flødevigen Sea Fish Hatchery.

# G. O. SARS



**TYPE:** Steel hulled, specially planned and constructed as Research Vessel, but hull originally built as Whaler. Equipped also as Trawler.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1950	170'7"	28.5'	17'4" (full)	950 tons (full)	595	178

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
	12.5			20 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
38	10

## **AFFILIATION**

Directorate of Fisheries, Institute of Marine Research, Bergen.

## **PROPULSION**

Diesel motor, single screw with controllable pitch, 1,200 HP. Uses Gas oil.

## **ELECTRICAL POWER**

Ship has two 45 KW and one 22 KW generators. Has 12.5 KVA available for scientific work. Available current: 220V DC, 45 KW; 220V DC, 22 KW; and 220V AC, 50-cycle, 12.5 KVA. Little electric power reserve over and above that required for operation of the ship and its installed instruments. No batteries currently available.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass, magnetic compass, radar (10 cm.), asdic, sounding apparatus, and loran (to be installed).

Communication - Radio-telegraph and telephone, intercom system, and ship's telephone system.

Echosounders - Simrad Research Sounder, built in 1961, with 5 freq., scale 12.5 m. to 10,000 m., with changeable ping length.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has two hydrographic winches on port side of main deck. One winch has 6,000 m. of 4 mm. wire, the other 2,000 m. of 4 mm. wire. Also large trawl winch on boat deck and an ordinary anchor winch. All winches hydraulic and made by A/S Hydraulik.

## **ACOUSTICAL CHARACTERISTICS**

Ship not equipped with special noise reducing apparatus.

## **LABORATORIES**

Total laboratory area about 36 sq. m.

## **HABITABILITY**

Ship strengthened against ice for Arctic work. Cabins and living

quarters centrally heated. No air-conditioning; not considered good for tropical climates, but does have central fan system which supplies fresh air to all cabins and living quarters. Fresh water capacity 59 tons; daily consumption about 3 tons; no distillation apparatus and no salt water showers. Water supply limiting endurance factor.

#### **OTHER FEATURES**

Equipped with side keels.

#### **TYPE OF OBSERVATIONS**

Ship is able to make hydrographic casts, take bottom samples, do dredging, and make continuous soundings.

#### **REMARKS**

Named after the late, well-known Norwegian marine biologist.

# GUNNAR KNUDSEN

NO PHOTO AVAILABLE

TYPE: No information

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1946	42'	15'	6.5'			

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
7			1,000 miles	

## COMPLEMENT

CREW	SCIENTIFIC STAFF
1	4

**AFFILIATION**

Institute of Marine Biology, University of Oslo.

**PROPULSION**

Semi-diesel "Rapp," 25 HP.

**ELECTRICAL POWER**

No information.

**NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Simrad echosounder with white line electronics.

**HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has two hydraulic hydrographic winches: one with 3,000' of 7 mm. wire and the other with 1,000' of 4 mm. wire.

**ACOUSTICAL CHARACTERISTICS**

No information.

**LABORATORIES**

Has one laboratory with space for two workers (3 sq. m.).

**HABITABILITY**

No information; presumably limited to local nearshore work.

**OTHER FEATURES**

Equipped with an oxygen recorder and densigraph.

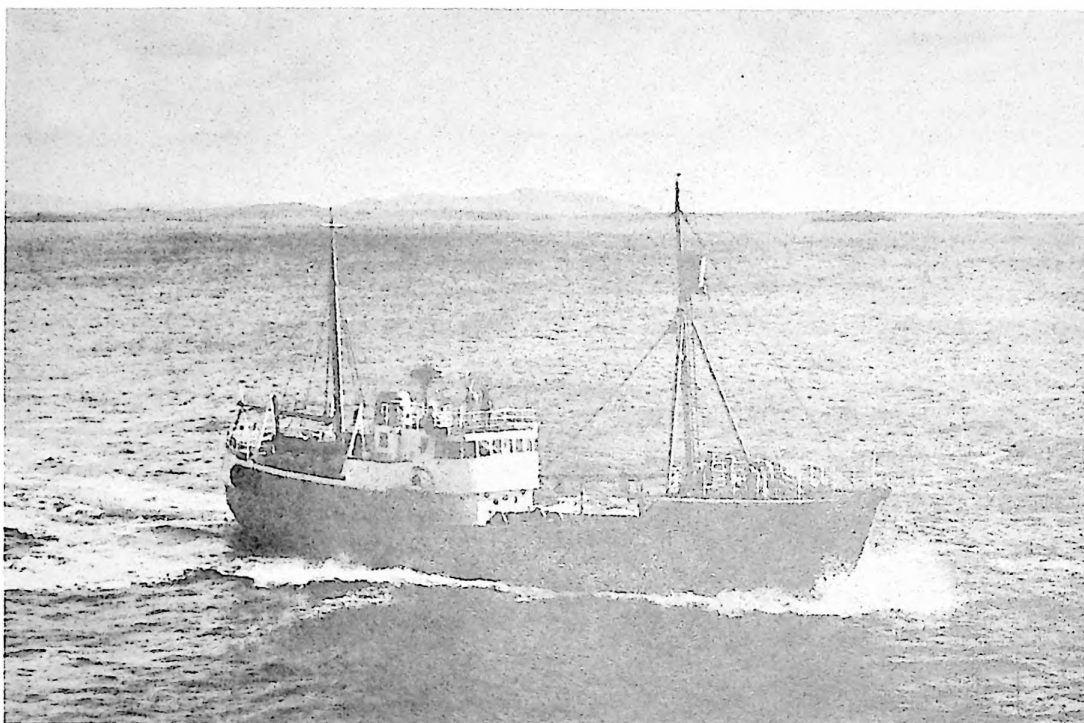
**TYPE OF OBSERVATIONS**

Oceanographic research.

**REMARKS**

None.

# HELLAND-HANSEN



**TYPE:** Built as Research Ship, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1957	113'7"	22'7"	10' (aft)		186	42

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
10	10.5	0	4,800 miles (at full speed)	17 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
7 to 8	7 to 8



## **AFFILIATION**

Geophysical Institute, University of Bergen.

## **PROPULSION**

Diesel engine, 400 HP. Steel propellers of variable pitch can be controlled from wheelhouse. Uses Gas oil (Shell).

## **ELECTRICAL POWER**

Main generator of 25 KW and smaller one of 10 KW. Ship normally requires 10 KW. Available for scientific work, 15-25 KW. Current is 220V AC and batteries give 24V DC (for radio and transmitter only).

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Magnetic compass, electric log; radio direction finder, radar (Decca type 212, 3 cm. wavelength), and loran.

Communication - Radio transmitter on regular ship's frequencies (1.8-3.3 MC), type Simrad, 70W.

Echosounders - Simrad shallow sounder for navigation purposes, recorder in wheelhouse. Same recorder may also be used for small asdic set. Simrad deep sea echosounder indicates bottom at all depths. Frequency about 10 KC. Length of pulse can be varied. Records on wet paper. Belt driven synchronous motor drives pen. Pen moves across non-linear scale. Precision varies with scale; at great depths is about  $\pm 10$  m. Also has Kelvin-Hughes MS26K. All echosounders can be connected to the electric log so that a mark is set for each nautical mile.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

All winches are hydraulic, manufactured by Norsk Motor A/S, Bergen. Hydrographic winches (2-1/2 ton lifting capacity) with 8,000 to 10,000 m. of 4 mm. wire. An auxiliary hydrographic winch (1-1/2 ton capacity) with 3,000 m. of 4 mm. wire. One heavy duty winch (4 tons) with 6,000 m. of 11 mm. wire. Heavy instruments can be handled from extra drum. Hand-operated winches for shallow work fitted as required.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

One laboratory (9 sq. m.) for hydrographic work. Has 220V AC current and running water.

## **HABITABILITY**

Designed to work in cold climate, would probably be uncomfortable in tropics. Carries 17 tons of fresh water; no distillation apparatus. Salt water showers available. Living quarters comfortable.

## **OTHER FEATURES**

Bow strengthened for ice. Ship provided with Ornell's rolling keels.

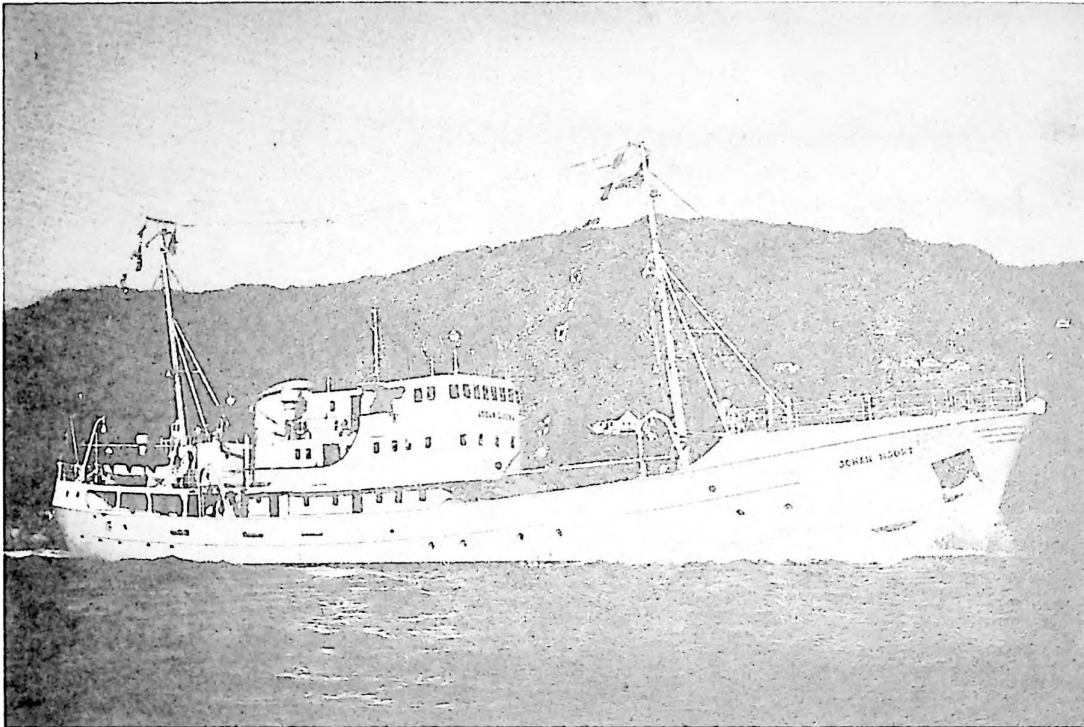
## **TYPE OF OBSERVATIONS**

Ship intended for most oceanographic observations, such as water sampling, coring, dredging, net hauls, and current measurements. Anchoring at great depths relatively easy. Observations requiring large laboratory space impractical.

## **REMARKS**

Difficult, but not impossible, to house women scientists.

# JOHAN HJORT



**TYPE:** Designed and built as a Research Vessel, also equipped as a Trawler, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1958	171.9'	30.6'	17.1' (full)	1,030 tons (full)	697	195

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
	13			26 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
38	10

## **AFFILIATION**

Institute of Marine Research, Directorate of Fisheries, Bergen.

## **PROPULSION**

Single-acting, 4-cycle diesel engine with fresh-water cooling in closed system, 1,300 HP. Propeller controllable from bridge. Between main engine and blade is hydraulic oil coupling. Steering electric-hydraulic. Two auxiliary 4-cycle diesel motors of 335 and 165 HP each have 110 KW DC generator. Uses Gas oil for main and auxiliary engines.

## **ELECTRICAL POWER**

Ship has two 110 KW generators. Has 12 KVA available for scientific work. Current available: 220V DC, 110 KW and 220V AC, 50-cycle, 12.5 KVA. Ship has considerable power reserve at its disposal on the 220V DC supply. No extra batteries for special purposes currently available.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Radar, RDF, electric log, gyrocompass, magnetic compass, asdic, loran (to be installed), and sounding apparatus.

Communication - Radio telegraph and telephone equipment supplied with emergency sender and receiver. Has ten loudspeakers posted in various places on vessel, all connected to central point in the pilot house. Has automatic telephone exchange for 30 telephones with connections all over ship.

Echosounders - Has five echosounders and asdic installations, including a 1961 Simrad Research Sounder, 5 freq., scale 12.5 m. to 10,000 m., with changeable ping length.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Two hydrographic winches, one with 6,000 m. of 4 mm. wire and one with 2,000 m. of 4 mm. wire. On forward deck is unloading boom (5-ton capacity) and trawler winch (tractive effort 25 tons). On the fore-castle deck an anchor winch and on boat deck smaller trawl winch. All winches hydraulic and made by A/S Hydraulik.

## **ACOUSTICAL CHARACTERISTICS**

Ship not equipped for special noise reduction.

## LABORATORIES

Besides one large laboratory, ship also has fish sampling room, cooler for fish samples, gyroroom, drafting room, darkroom, asdic room, radio room, and instrument room. Total laboratory space 37 sq. m.

## HABITABILITY

Very comfortable but not ideally suited for tropical climate. Ship built in accordance with highest class in Det Norske Veritas and equipped for voyages in all waters under the rules of the Norwegian Ship Control. Carries 76 tons fresh water; no distillation apparatus; normally uses about 3 tons/day; no salt water showers. All staterooms white enameled and have furniture of light mahogany or oak.

## OTHER FEATURES

Large motor drives hydraulic pumps for trawl winch. In addition to usual central heating, ship equipped with warm-air ventilation system with fans forcing warmed fresh air to all staterooms. Boiler for central heating oil fired. Ship has side keels and hull strengthened for ice navigation. Has freezing room for fish samples.

## TYPE OF OBSERVATIONS

Primarily fisheries research but is able to perform hydrographic casts, bottom sampling, dredging, and continuous soundings.

## REMARKS

Ship named after the late, well-known Norwegian marine biologist.

# PEDER RØNNESTAD

NO PHOTO AVAILABLE

**TYPE:** Built as Trawler and later converted to Research Vessel, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1948	86'2"	21'0"	10'0" (full)	172 tons (full)	126	29

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
	9.3			10 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
8	4

## **AFFILIATION**

Directorate of Fisheries, Institute of Marine Research, Bergen.

## **PROPULSION**

Diesel motor with single controllable pitch propeller, 250 HP. Uses Gas oil.

## **ELECTRICAL POWER**

Ship has 12 KW and 1.5 KW generators. Currents available: 110V DC, 12 KW and 24V DC, 1.5 KW. Ship has some power reserve at its disposal on the 110V DC supply.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Magnetic compass, electric log, radar (3 cm.), asdic, and sounding apparatus.

Communication - Radio-telephone and intercom system.

Echosounders - Simrad asdic, 30 KC, range 750 to 1,500 m. and a Simrad echosounder, 38.5 KC.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Ship has two hydrographic winches of which one is on starboard side of boat deck and other on port side of main deck. Both winches have drum capacity of 2,000 m. of 4 mm. wire. Also has trawl winch. All winches made by A/S Hydraulik.

## **ACOUSTICAL CHARACTERISTICS**

Not equipped with special noise reducing apparatus.

## **LABORATORIES**

Total laboratory area is 12 sq. m.

## **HABITABILITY**

Cabins and living quarters centrally heated, and hull strengthened for ice; hence suitable for Arctic work. No air-conditioning; not fully suitable for tropical climates. Central fan system supplies

fresh air to all cabins and living quarters. Fresh water capacity is 7.5 tons; daily consumption about 750 liters; no distillation apparatus or salt water showers. Water supply is limiting endurance factor.

#### **OTHER FEATURES**

Equipped with side keels.

#### **TYPE OF OBSERVATIONS**

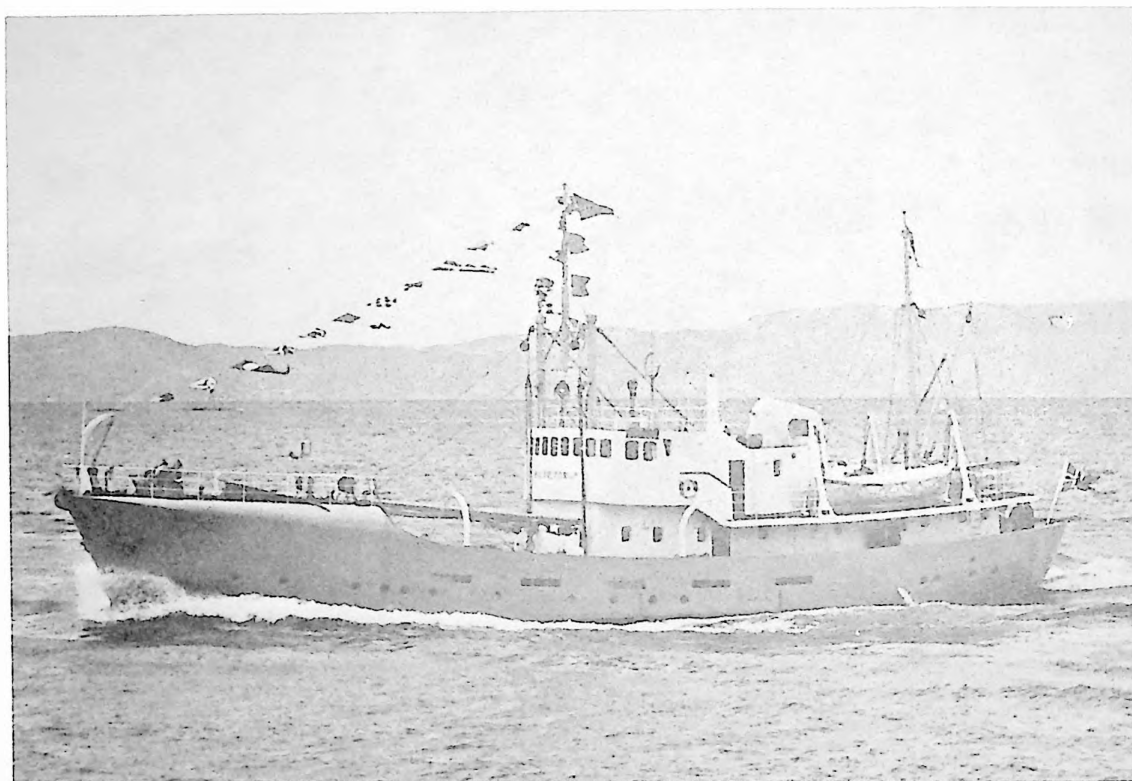
Can make hydrographic casts, take bottom samples, do dredging and make continuous soundings.

#### **REMARKS**

Named after the late Norwegian well-known for his practical fisheries investigations. Ship converted for research in 1959.



# H. U. SVERDRUP



**TYPE:** Trawler type, steel hull. Specially designed as research vessel.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1960	127'	25'	13'	400 tons	295	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
11	11.5	0	5,000 miles	

## COMPLEMENT

CREW	SCIENTIFIC STAFF
9	10

fresh air to all cabins and living quarters. Fresh water capacity is 7.5 tons; daily consumption about 750 liters; no distillation apparatus or salt water showers. Water supply is limiting endurance factor.

#### OTHER FEATURES

Equipped with side keels.

#### TYPE OF OBSERVATIONS

Can make hydrographic casts, take bottom samples, do dredging and make continuous soundings.

#### REMARKS

Named after the late Norwegian well-known for his practical fisheries investigations. Ship converted for research in 1959.

## **AFFILIATION**

Norwegian Defense Research Establishment.

## **PROPULSION**

Diesel 6 cylinder two-stroke. Single propeller, controllable pitch, 600 HP. Uses Esso Mobilgas.

## **ELECTRICAL POWER**

Has two 30 KW, 220V, 50-cycle and one 12 KW, 220V, 50-cycle generators. The 30 KW generators are driven by 45 HP diesels, the 12 KW generator by 18 HP diesel. Normal ship operation requires 20 KW; available for scientific instruments 30 KW. Characteristics: 220V 50-cycle/220V DC, 5 KW rotary converter; 220V 50-cycle - 24V DC, 3.6 KW rotary converter; 220V 50-cycle/115V 400-cycle, 7 KVA rotary converter; 220V 50-cycle/117V 50-cycle, 5 KVA transformer. A 24V battery with a capacity of 1,000 amp.-hrs. is included and may be used to drive a 24/220V DC, 50-cycle, 1 KW rotary converter.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Sperry Minor gyrocompass, automatic pilot, electric log, loran, radio direction finder, small type sonar-Simrad, plotting table for plotting of own ship and two contacts, Decca 978 radar.

Communication - Two 400W transmitters and two communication receivers covering the frequency bank 1.5-24 MC in addition to the medium band 400-550 KC. Also a 70W radio telephone and a battery-driven emergency radio station.

Echosounders - Two Navigational Simrad 30 KC and 38 KC. One deep sea Simrad 11 KC, one stabilized precision 50 KC. Variable ping length, tuning fork accuracy of time measurements.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One deep sea anchoring winch with 5,000 m. of 12 mm. wire, for anchoring in depths to about 3,000 m. Combined with boom, this winch may also be used for lowering heavy equipment down to great depths. Maximum lift 4 tons. One cable winch with storage capacity for 6-7,000 m. of electric cable with double steel wire armouring. Two hydrographic winches with 5,500 m. of 4 mm. steel wire for handling lighter equipment. Hoisting velocity 3 m./sec. Maximum lift 1 ton. One cargo winch for use with a 3 ton boom mounted just forward of the deckhouse on the port side. A similar arrangement on the

starboard side is now being replaced by a hydraulic operated crane which will make the handling of heavy equipment more easy. One towing winch mounted on the stern aft of the deckhouse for towing projectors and other equipment. Maximum lift 4 tons. One boat winch mounted on the boatdeck, used for handling equipment over the stern. All winches are hydraulic.

### **ACOUSTICAL CHARACTERISTICS**

Ship can be silenced 4-5 hours.

### **LABORATORIES**

Has four laboratories; oceanographic laboratory 65 sq. ft., sound recording laboratory 160 sq. ft., general electronic laboratory 375 sq. ft., and hydrographic laboratory 65 sq. ft.

### **HABITABILITY**

Not designed for working in tropics. Fresh water capacity 40 tons.

### **OTHER FEATURES**

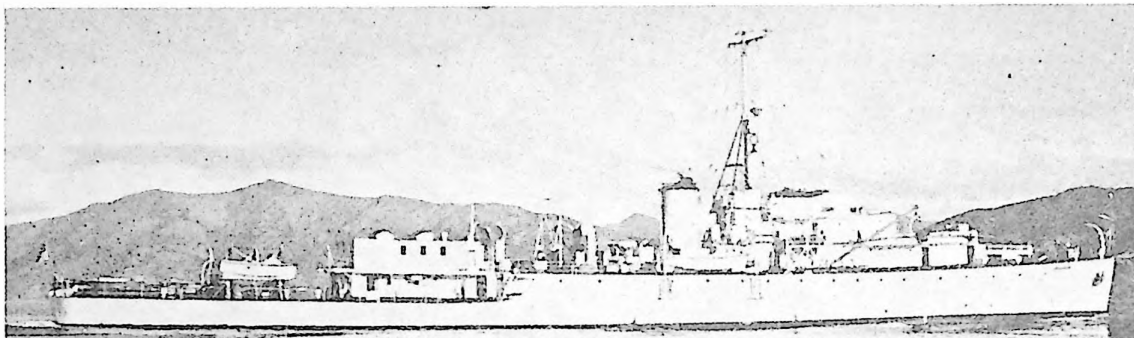
Ship has a center well with a 60 in. sonar dome fitted. Also a cylindrical well with a diameter 2 ft. from the weather deck through the general laboratory. No antiroll devices but instruments may be stabilized by using signals from a gyro stabilizer. Oceanographic work can be carried out up to Sea State 4.

### **TYPE OF OBSERVATIONS**

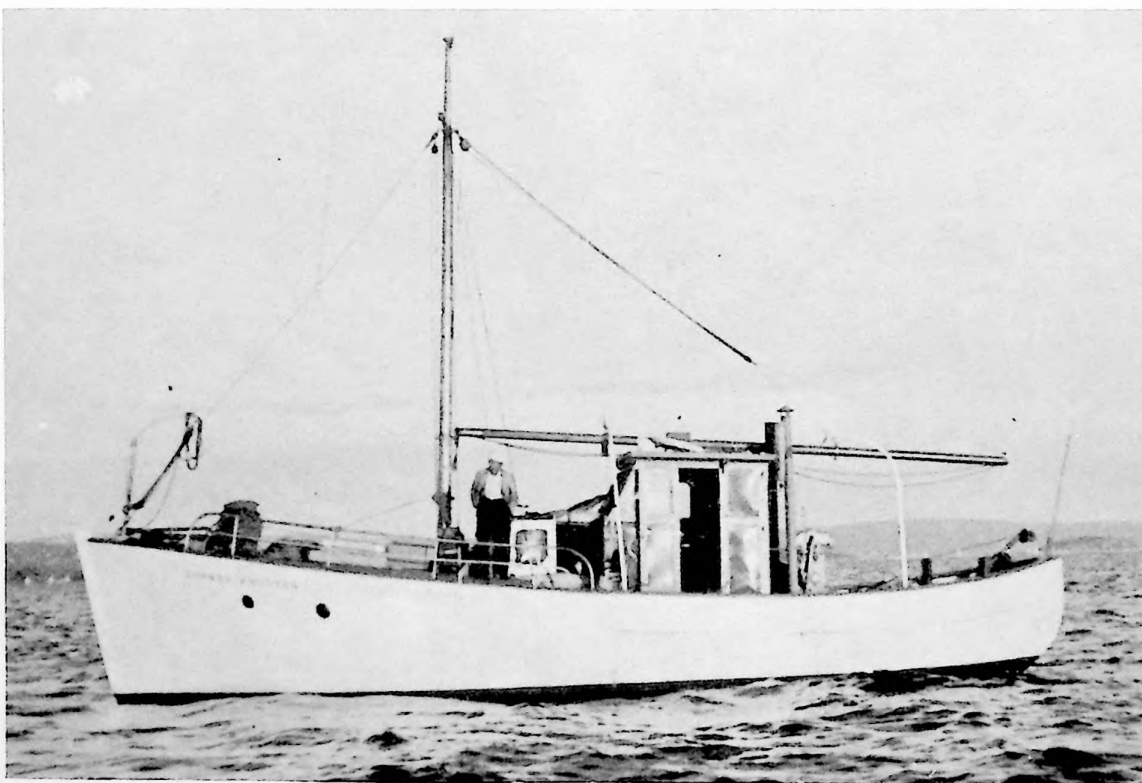
Designed for physical oceanography with particular reference to acoustics. No biological work performed.

### **REMARKS**

Vessel built according to Norwegian Veritas Class + 1A1 (Ice), and is certified for unlimited travel.



LACHLAN, paste on page 45.1



GUNNAR KNUDSEN, paste on page 46.13

# PAKISTAN

## SECTION 47

# MADAGAR

NO PHOTO AVAILABLE

TYPE: Salvage Tug, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
	205'	38'	16.5' (full)		1,682	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
12.3	14.8	1	9,000 miles	35 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
100	2

## **AFFILIATION**

Naval Ship, with the Hydrographic Department, Karachi.

## **PROPULSION**

Diesel electric drive (4 engines), single fixed-blade screw. Uses type H.S.D. oil; tank capacity 312 tons.

## **ELECTRICAL POWER**

Ship generates 300 KW and requires 120 KW for normal operations. Ship has three dynamos of 110V, 100 KW each. Current available: 15 KW, 120V AC, 60-cycle.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass (Sperry) and radar.

Communication - Radio-telephone, intermediate wave (1.5-24 MC) and short wave (220-499 MC). CW world wide (1.5-24 MC).

Echosounders - NJ-/9, time controlled by potentiometer.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has one towing winch with 1,800' of cable. One seaplane winch used for deep coring, and a boat hoisting winch used for Nansen bottle casts.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Space available for laboratory (200 sq. ft.).

## **HABITABILITY**

Carries 101 tons of fresh water; has distillation facilities and salt water showers. Presumably capable of operations in all ice-free waters.



**OTHER FEATURES**

Bilge keels; speed reduction to 6 kts. required by Sea State 5.

**TYPE OF OBSERVATIONS**

Can perform classical oceanographic observations.

**REMARKS**

Ship is salvage tug with heavy winches and towing facilities.

# ZULFIQUAR

NO PHOTO AVAILABLE

**TYPE:** RIVER Class Frigate, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1940	301'4"	36'8"	11'4" (aft)		1,611	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
10	19	4	7,500 miles	30 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
160	3

## **AFFILIATION**

Hydrographic Department, Karachi.

## **PROPULSION**

Steam reciprocating engine, twin fixed-blade screws. Uses furnace fuel oil; capacity 600 tons.

## **ELECTRICAL POWER**

Ship generates 120 KW and requires 60 KW for normal operation. Ship has two dynamos of 220V, 60 KW each. Other currents available: 230V AC, 50-cycle, 4.5 KVA; 150V AC, 1,000-cycle, 1 KVA; and 22-33V DC, 0.75 KW.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Marconi radio locator and sonar.

Communication - Radio-telephone, medium wave (1.5-24 MC) and short wave (100-156 MC). CW world wide (1.5-24 MC).

Echosounders - Kelvin-Hughes, Admiralty type 767 and 768, range 1,100 fms. Speed of stylus regulated by ship's voltage supply. Also has two portable sounders for use by motor boats.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One electric oceanographic winch (Stottert and Pitt Ltd.) with 9,000m. of 3.5 mm. wire. Two kelvin sounding machines with 1,800' of wire. One steam windlass anchoring winch with 650' of 1-7/16" cable.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

None at present, but facilities could be made available.

## **HABITABILITY**

Carries 92 tons of fresh water; distillation capacity 24 tons/day.

Has salt water taps. Presumably capable of operation in all ice-free waters.

#### OTHER FEATURES

None. Speed reduction to 8 kts. required by Sea State 6.

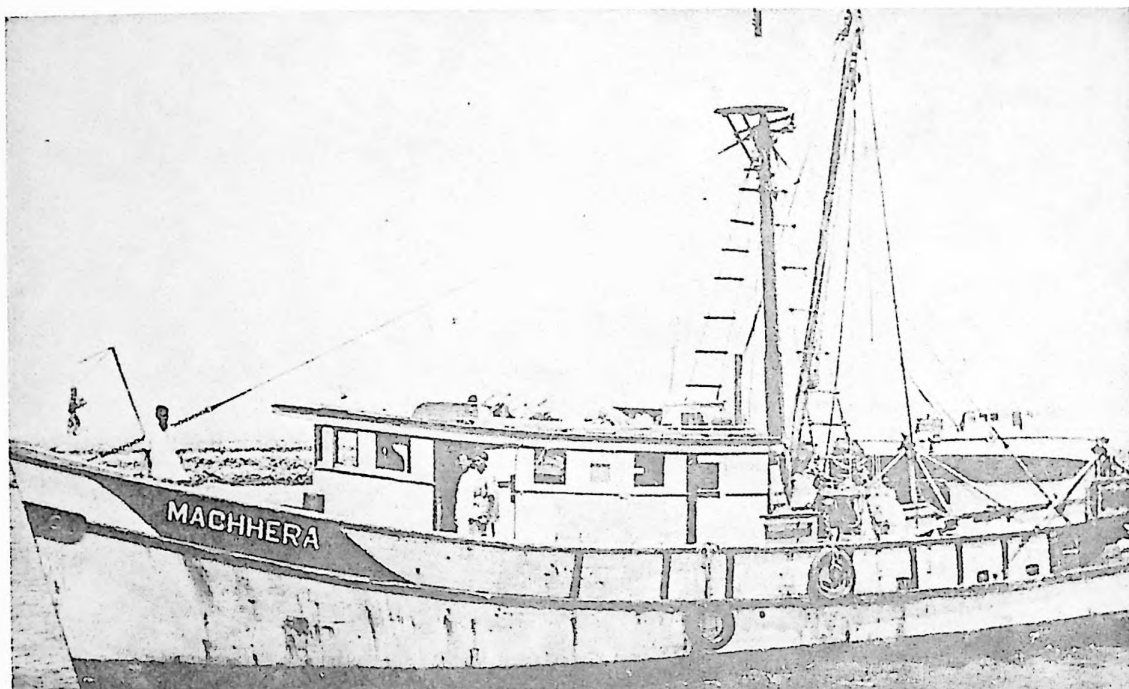
#### TYPE OF OBSERVATIONS

Primarily hydrographic.

#### REMARKS

None.

# MACHHERA



TYPE: Purse-seiner, wood hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
	67'	19'	8'		60	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
6	8 1/2		1,000 miles	3 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
12	1

## **AFFILIATION**

Central Fisheries Department, Fish Harbour, West Wharf Karachi, Pakistan.

## **PROPULSION**

Caterpillar Diesel, 120 HP, with single fixed-blade propeller. Carries 12 1/2 tons fuel oil.

## **ELECTRICAL POWER**

Has 110V DC from 28 HP Hercules generator.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

No information on navigation and communication equipment. Has a depth recorder.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has a mechanical anchor winch with 810 ft. of single chain, and a double drum mechanical trawl winch with 1,800 ft. of wire on each spool.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

No information.

## **HABITABILITY**

Carries 1 ton of fresh water.

## **OTHER FEATURES**

Has a fish magnifier.

## **TYPE OF OBSERVATIONS**

Exploratory fishing, experimental fishing to improve gear efficiency, fisheries training, and trawling.

## **REMARKS**

She is completely sea-worthy and easy to maneuver.

# NEW HOPE



TYPE: Fishing Boat, wood hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
	38'	11.6'	4'		14.9	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
5	7		200 miles	2 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
5 (total)	

## **AFFILIATION**

Central Fisheries Department, Government of Pakistan, Fish Harbour,  
West Wharf, Karachi.

## **PROPULSION**

Main engine is GM diesel, 83 HP. Has single fixed pitch propeller.  
Also has an auxiliary 5 HP Fairbanks diesel. Carries 2.1 tons of  
fuel oil.

## **ELECTRICAL POWER**

Has 110V DC.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

No information on navigation, communication and echosounding equipment.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has a mechanical trawl winch with 225 ft. of cable.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

None.

## **HABITABILITY**

Carries 0.32 tons of fresh water.

## **OTHER FEATURES**

Has a 274 cu. ft. fish hold.

## **TYPE OF OBSERVATIONS**

Used in exploratory fishing, experimental fishing to improve gear  
efficiency, and fisheries training.

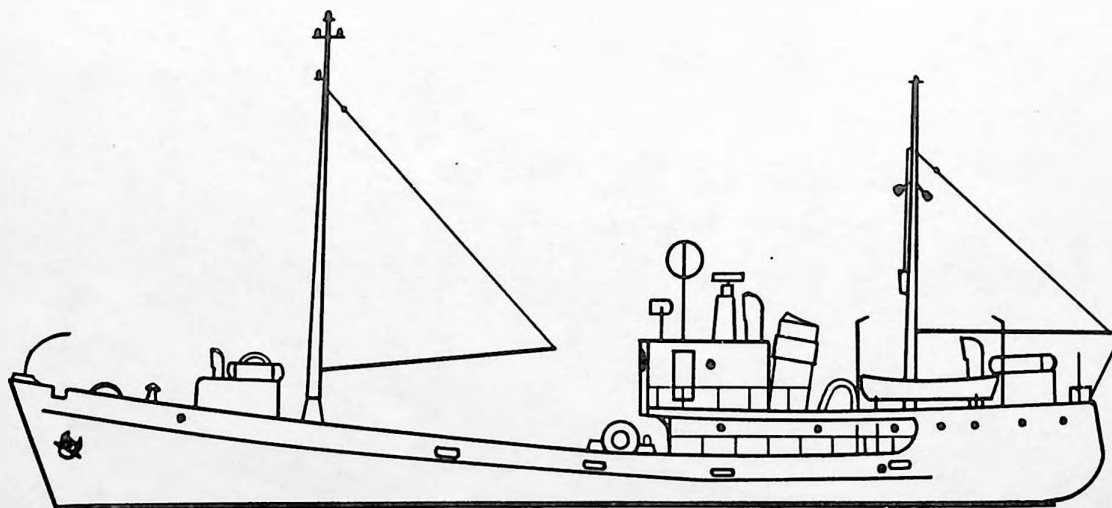
## **REMARKS**

Does not stand heavy weather because she is top heavy.





ZULFIQUAR, paste on page 47.4

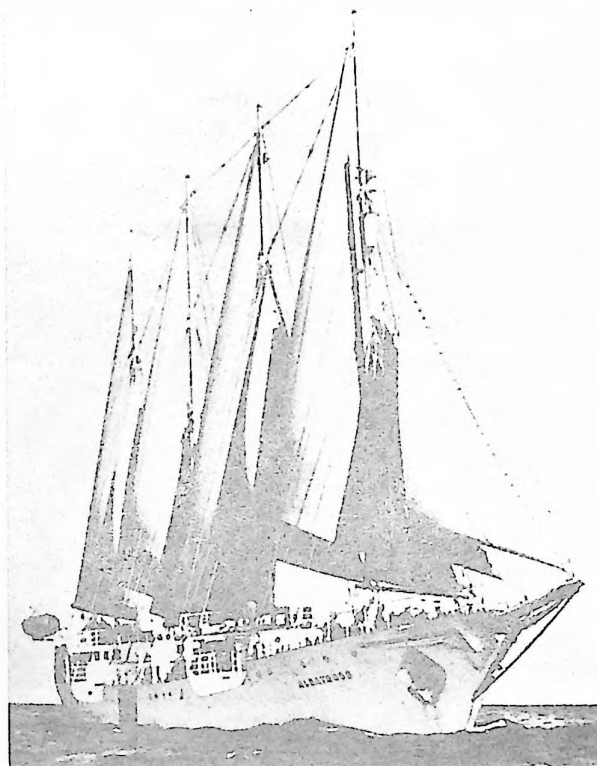


MAZIRBE, paste on page 59.4

# SWEDEN

SECTION 55

# ALBATROSS



**TYPE:** Four masted fore-and aft-rigged Schooner.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1942	260'	37'7"	12'8"		1,185	695

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
			20,000 miles	95 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
31	12

## **AFFILIATION**

Royal Society of Göteborg.

## **PROPULSION**

One, single-acting, two-cycle, solid injection, diesel motor, 600 IHP at 315 r.p.m. Hydraulically reversible propeller. Fuel consumption about 2 tons/day; fuel capacity 191 tons. Wind area of sails 921 sq. m. Total area, excluding spare sails, 1,121 sq. m.

## **ELECTRICAL POWER**

No information.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Has 7,500 m. echosounding machine and "Lucas" sounding machine. Other equipment not known.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One 15 ton winch and two electrically driven winches.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Has several laboratories, aquaria, photographic rooms, work-shops, etc.

## **HABITABILITY**

No information, but presumably capable of operating in all navigable waters. Carries 93 tons of fresh water. Quarters comfortable.

## **OTHER FEATURES**

Hull strengthened for ice navigation.

**TYPE OF OBSERVATIONS**

Oceanographic and meteorological.

**REMARKS**

None.

# TURKEY

## SECTION 57

# ARAR

NO PHOTO AVAILABLE

TYPE: No information.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
	102'6"	21'4"		200 tons		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
9	10		5,000 miles	

## COMPLEMENT

CREW	SCIENTIFIC STAFF
11	1

## **AFFILIATION**

Meat and Fish Association.

## **PROPULSION**

Diesel engine, 375 HP.

## **ELECTRICAL POWER**

Has constant frequency current and one 42 HP auxiliary generator producing 110V DC, 30-35 KW. Has a DC to AC converter for echosounder and radio.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - No information.

Communication - Has one VHF voice transmitter and receiver.

Echosounders - Has an echosounder and a Simrad Mod. 510-3 recorder.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has an electric hydrographic winch with 1,650' of wire.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Has two laboratories each approximately 9 sq. m., one amidships and other aft, for sea water analyses and biological research.

## **HABITABILITY**

No information.

## **OTHER FEATURES**

Has small cold storage facility.



#### TYPE OF OBSERVATIONS

BT, hydrographic casts, dredging, plankton tows, and trawling.

#### REMARKS

Generally carries one biological oceanographer from Research Department of Istanbul University.

# ÇARSAMBA

NO PHOTO AVAILABLE

**TYPE:** Escort Minesweeper, ex-U. S. AUK type.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
	221'	32'	11'	1,150 tons (full)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
12	18		8,000 miles	

## COMPLEMENT

CREW	SCIENTIFIC STAFF
64	1

## **AFFILIATION**

Navigation and Hydrographic Department, Istanbul.

## **PROPULSION**

Diesel-electric (2 GM diesel engines).

## **ELECTRICAL POWER**

Current from three sources of 110V AC, 60-cycle and one source of 440V AC, 60-cycle. No constant frequency current available.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Two U. S. made radar sets and British made CV 134 sonar.

Communication - Several U. S. Navy transmitters and receivers capable of voice and CW transmission.

Echosounders - Several U. S. and British-type echosounders.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

No information.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Has a drafting room; no other information.

## **HABITABILITY**

No information.

## **OTHER FEATURES**

No information.

**TYPE OF OBSERVATIONS**

BT, hydrographic casts (shallow), current measurements, and bottom sampling.

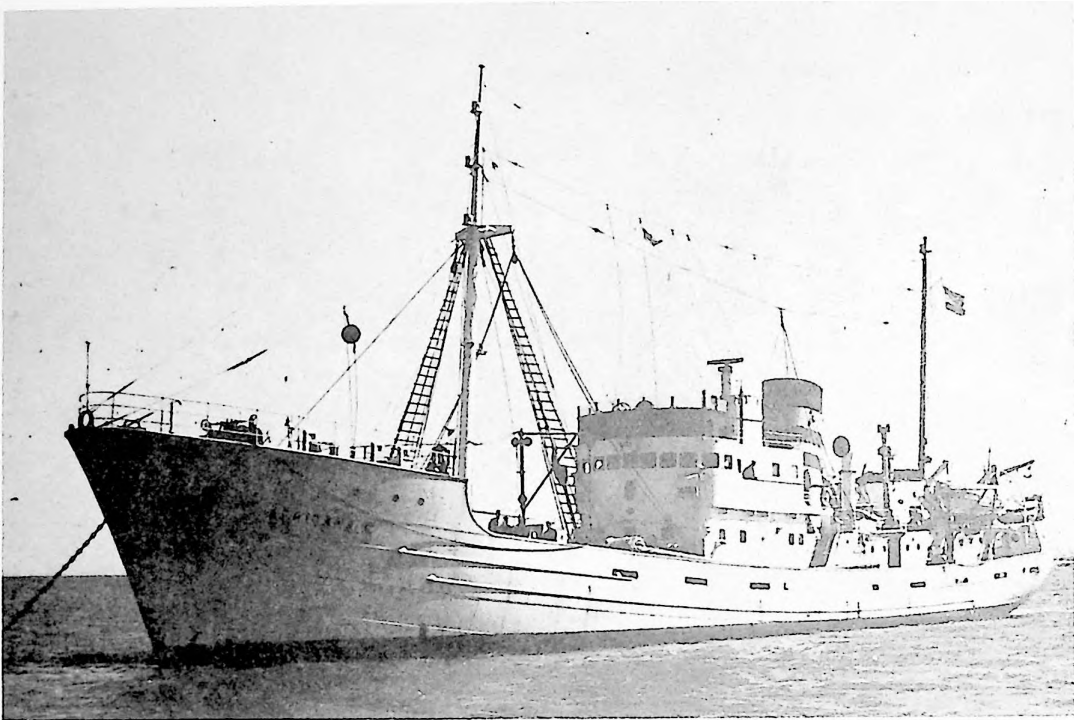
**REMARKS**

None.

# **UNION OF SOUTH AFRICA**

## **SECTION 58**

## AFRICANA II



**TYPE:** Steel hulled Trawler.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1950	206'2"	33'	16'2"	1,300 tons	882	249.4

### PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
10	12-1/2	2	6,000 miles	25 days

### COMPLEMENT

CREW	SCIENTIFIC STAFF
30	6

## **AFFILIATION**

South African Government, Department of Commerce and Industries,  
Fisheries Board.

## **PROPULSION**

Steam, triple expansion, single fixed-blade screw. Uses Black furnace oil, fuel capacity 378 tons.

## **ELECTRICAL POWER**

Ship generates 61 KW DC. Has two 220V dynamos. Also available, 220V AC, 50-cycle, 2-1/2 KW single-phase for scientific use.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Kelvin-Hughes Type 14/9 Radar, RDF (Marconi Lodestone).

Communication - Marconi Transarctic, voice and CW operated transmitter. Marconi Transarctic Type 993 receiver. Transmits on MF 375-500 KC, HF 1.5-13 MC. Receives on 200-520 KC, 0.6-13 MC. Crystal frequencies: 1650, 1700, 2182, 2203, 2607, and 2730 KC.

Echosounders - Marconi Sea-Vista Type 841A, Marconi Sea-Graph Type 840A, Kelvin-Hughes MS21 Type J2. Range to 3,000 fms.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One Clarke-Chapman steam scientific winch with 6,000' of 1" wire. One Robertson and Fleetwoord steam winch with 6,000' of 2-3/4" flexible cable. Two Reader winches with 18,000' of 4 mm. wire. One Emerson-Walker anchoring winch with up to 540' of 1-7/16" cable.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Biological and chemical laboratories in the bridge superstructure. Both have fresh and salt water taps and electrical outlets.

#### **HABITABILITY**

Has forced air ventilation system and steam heat. Carries 92 tons of fresh water. Has distillation facilities for laboratory only. No salt water showers.

#### **OTHER FEATURES**

No antirolling devices but ship can perform oceanographic observations up to wind force 7.

#### **TYPE OF OBSERVATIONS**

Primarily used in fisheries and oceanographic research.

#### **REMARKS**

None.



# JOHN D. GILCHRIST



**TYPE:** Wooden hulled Trawler.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1947	75'	20'	9'	95 tons		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
8	9	1	1,000 miles	6 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
6	9

## **AFFILIATION**

Oceanographic Department, University of Capetown.

## **PROPULSION**

Diesel, single fixed-blade screw, 265 HP. Uses Diesoline at about 10 gal./hr. Capacity 5,700 cu. m.

## **ELECTRICAL POWER**

Ship generates 56 KW DC, 3.5 KW AC. Normal ship operation requires 20 KW DC and 1.5 KW AC. Power characteristics: 230V AC, 3-1/2 KW, 50-cycle, single-phase. One hundred-ten V DC, 23 KW from main generator. One hundred-ten DC, 20 KW from auxiliary generator. Thirteen KW, 110 DC from battery.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Magnetic compass, gyrocompass, RDF, and radar (to be installed).

Communication - Marconi Stentor Type 290 (Voice) Transmitter. Marconi Comet type 320 Receiver. Transmits on 1650 KC to 2182 KC. Frequency Bands: 130-350 KC, 600-1600 KC, 1.6-4.0 MC, 1650-1730 KC, and 1280-2340 KC. Crystal frequencies: 1650, 1690, 2016, and 2182 KC.

Echosounding - Marconi Graphette Type 1906A, Marconi Graphette Type 848 N. B. N. I. O. Mufax Echosounder (to be installed).

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One hydrographic winch with 4,000 m. of 4 mm. wire. One BT winch with 400 m. of 2 mm. wire. One trawling winch (2 drums) with 1,440' of 1/2" wire and 300' of 2" cable.

## **ACOUSTICAL CHARACTERISTICS**

Can be put in noiseless condition for one hour.

## **LABORATORIES**

One dry laboratory (4.3 sq. m.) with fresh and salt water taps and electrical outlets. One wet laboratory (2-1/2 sq. m.).

### **HABITABILITY**

Can work in tropics but not at poles. Carries 2.3 tons of fresh water, no distillation apparatus.

### **OTHER FEATURES**

None.

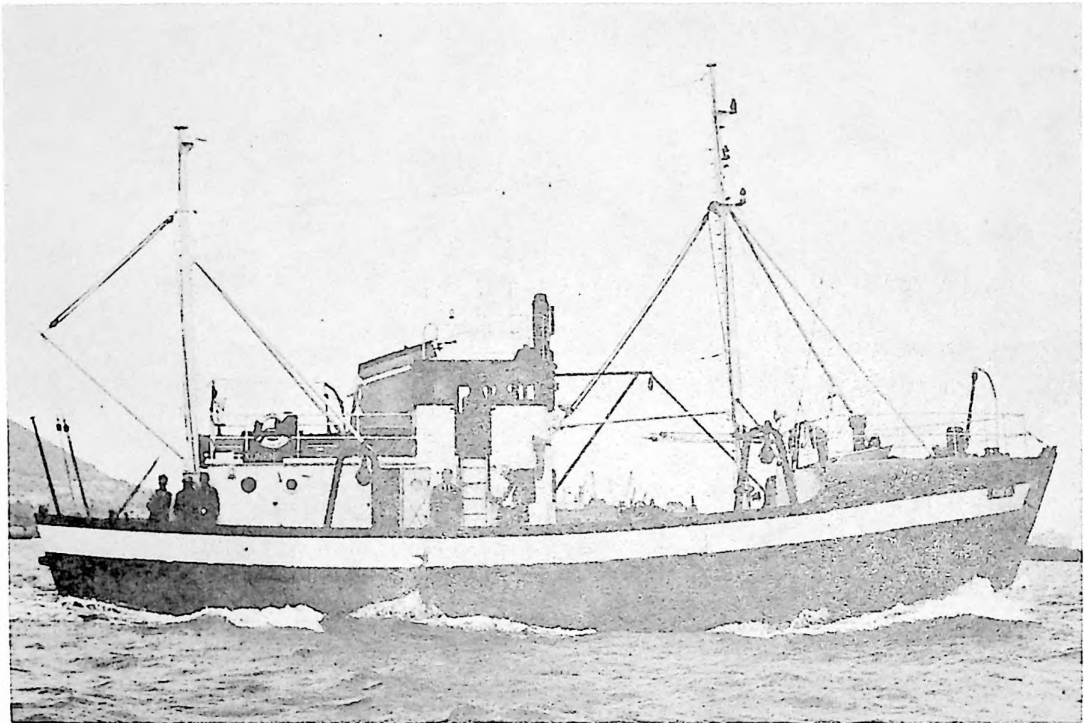
### **TYPE OF OBSERVATIONS**

Hydrographic casts, bottom sampling, dredging, plankton tows.

### **REMARKS**

Vessel is converted fishing trawler.

# KUNENE



**TYPE:** Fishing Vessel, wooden hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
	69-1/2'	20'	11'	85 tons		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
9	9-1/2		1,500 miles	

## COMPLEMENT

CREW	SCIENTIFIC STAFF
9	2

## **AFFILIATION**

South African Government, Department of Commerce and Industries.

## **PROPULSION**

B & W Alpha diesel 180 HP.

## **ELECTRICAL POWER**

Two sources of 220V DC, 6.5 KW. Constant frequency current available.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - None

Communication - NS 6M-12 Woodsons, can transmit and receive up to 500 miles. Crystal frequencies: 2182, 2009, 2003, 1700, and 1650 KC.

Echosounders - 510-3 Simrad, echo, and asdic sounders.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Two hydraulic hydrographic winches with 3,200' of 4 mm. wire each. One A4-trawl winch (hydraulic) with 1,500' of 1-3/4" wire. One G16 hydrographic (hydraulic) winch with 1,000 m. of 4 mm. wire. Anchoring winch (G16 hydrographic) with 456' of 5/8" cable.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Biological laboratory in bridge structure.

## **HABITABILITY**

No information.

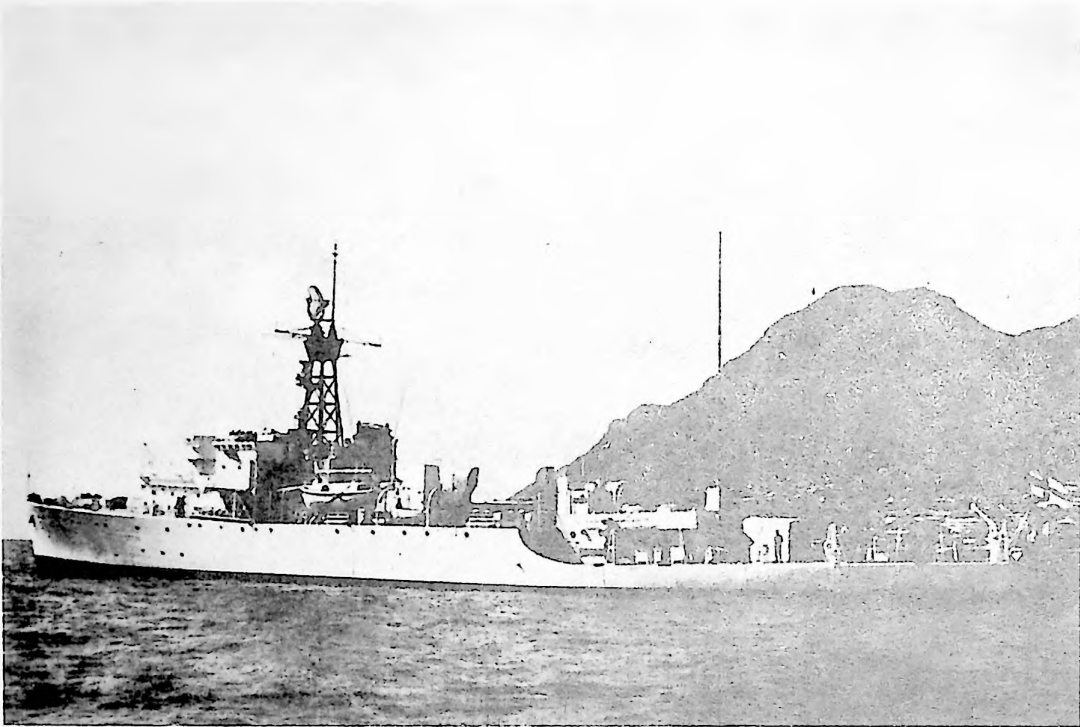
## **OTHER FEATURES**

None.

**TYPE OF OBSERVATIONS**  
Fisheries research.

**REMARKS**  
None.

# NATAL



**TYPE:** Former Royal Navy Frigate.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1944	307'4"	38'7"	14' (aft)	2,260 tons (full)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
10	18		4,200 miles	25 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
120	4

## **AFFILIATION**

Hydrographic Office, Department of Defense.

## **PROPULSION**

Two 4-cylinder triple expansion reciprocating engines, twin fixed-blade screws, 5,500 IHP. Uses Admiralty furnace fuel. Capacity 720 tons (660 tons useable).

## **ELECTRICAL POWER**

Ship generates 180 KW. Normal ship operation requires 100 KW. Eighty KW available for scientific work. Ship current supply 200 V DC.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Radar (type 244 and 974), asdic (type 144), gyro and standard compass with repeaters, Chernikeef log, RDF, Decca (2 range).

Communication - Transmission and reception on low, high, and medium frequencies. Has various types of equipment.

Echosounders - Kelvin-Hughes MS26B (720 fms.) and Kelvin-Hughes MS26J (1640 fms.). One hundred per cent accuracy controlled by bar check and Lucas wire machine test.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One electric hydrographic winch with 3,000' of 1-1/4" wire. One electric BT winch with 3,000' of 1/4" wire. One steam anchoring winch with 1-3/4" cable.

## **ACOUSTICAL CHARACTERISTICS**

Not possible to run ship "quiet."

## **LABORATORIES**

Combined laboratory and dark room (14' x 10') located below bridge. Has hot and cold water and electrical outlets.

## **HABITABILITY**

Can work in all climates. Carries 140 tons of fresh water. Distillation 30 tons/day.



#### **OTHER FEATURES**

Bilge keels; ship can perform oceanographic work up to Sea State 4.

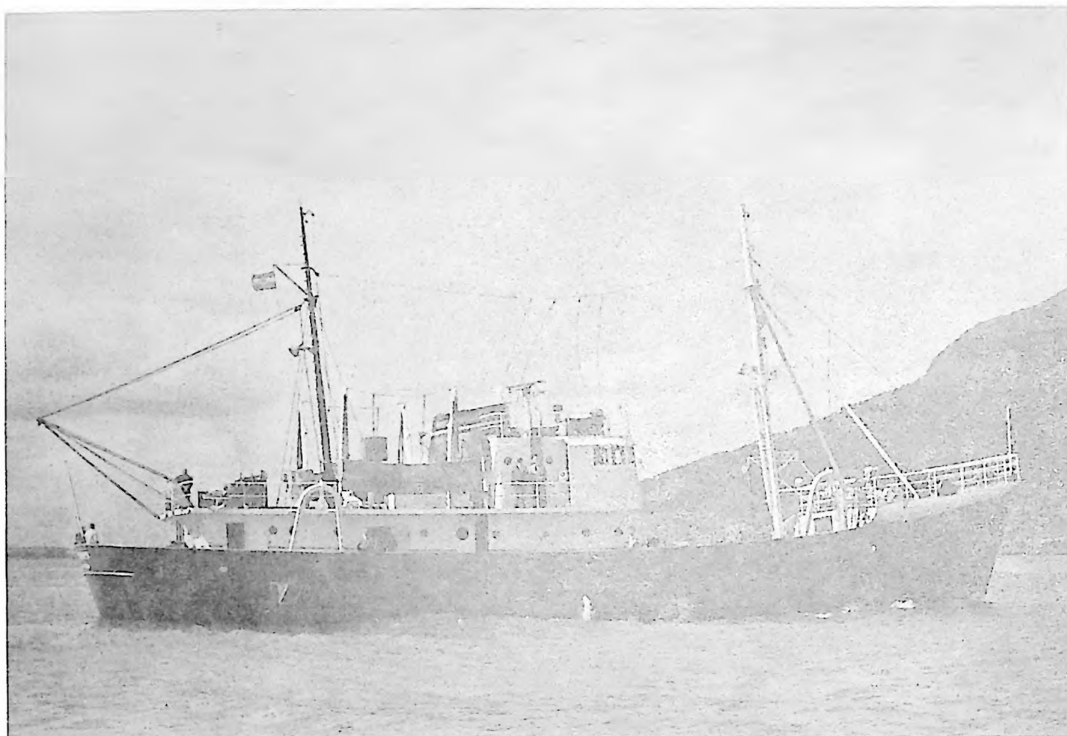
#### **TYPE OF OBSERVATIONS**

Primarily hydrographic surveying but performs oceanographic work also. Hydrographic casts, BT, bottom sampling, dredging, coring, seismic work, and meteorological observations.

#### **REMARKS**

None.

# SARDINOPS



**TYPE:** Steel hulled Trawler.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
	107'11"	25'	12'	341.6 tons		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
11-1/2	12		4,500 miles	

## COMPLEMENT

CREW	SCIENTIFIC STAFF
15	3

## **AFFILIATION**

South African Government, Department of Commerce and Industries.

## **PROPULSION**

Diesel, two stroke single acting, 600 BHP.

## **ELECTRICAL POWER**

Has 220V AC, 55 KVA; 220V DC, 55 KW; and 220V DC, 6 KW.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Kelvin-Hughes Type 14 radar.

Communication - Woodson Super Clipper (voice) transmitter and receiver. Can transmit and receive over 600 miles under normal conditions. Crystal frequencies: 2182, 2203, 1650, 1700, 2009, 2100 KC.

Echosounders - Simrad models, 510.3 (275 fms.) and 513.1 (5,280 m.).

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One hydraulic A/B hydrographic winch with 18,000' of 4 mm. wire.  
One hydraulic trawl winch with 4,500' of 0.55" wire. One hydraulic A/B BT winch with 6,000' of 4 mm. wire. Tow net winch (two drums) with 2,000' of 0.35" wire. One hydraulic A/B (B4 Special) anchoring winch with 540' of 1" studded cable.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Has hydrological laboratory with facilities for two workers and a biological laboratory with facilities for three persons.

## **HABITABILITY**

No information.

## **OTHER FEATURES**

None.

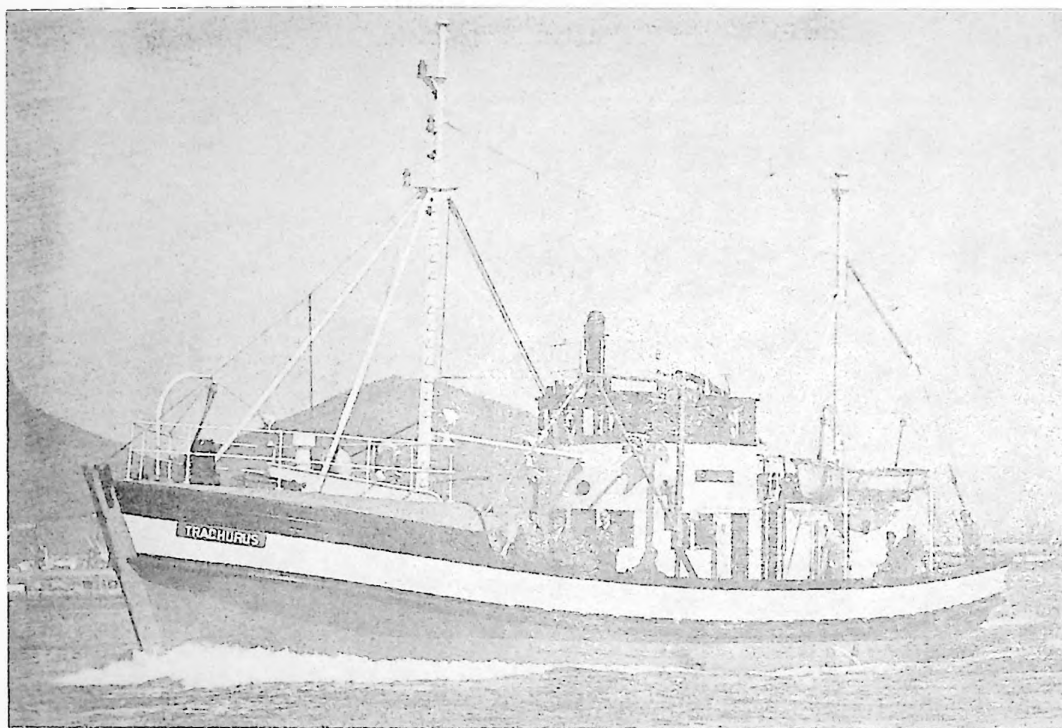
**TYPE OF OBSERVATIONS**

Primarily used for fisheries and oceanographic research.

**REMARKS**

None.

# TRACHURUS



**TYPE:** Fishing Vessel, wood hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
	69-1/2'	20'	11'	85 tons		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
9	9-1/2		1,500 miles	

## COMPLEMENT

CREW	SCIENTIFIC STAFF
9	2

## **AFFILIATION**

South African Government, Department of Commerce and Industries.

## **PROPULSION**

B & W Alpha diesel, 180 HP.

## **ELECTRICAL POWER**

Constant frequency current available. Also, 220V DC, 6.5 KW.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - No modern equipment.

Communication - NS6M-12 Woodsons can transmit and receive up to 500 miles. Crystal frequencies: 2182, 2009, 2003, 1700, and 1650 KC.

Echosounders - 510-3 Simrad, echo and asdic sounders.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Two hydraulic hydrographic winches with 3,200' of 4 mm. wire. One A4-trawl hydraulic winch with 1,500' of 1-3/4" wire. One G16 hydrographic winch with 1,000 m. of 4 mm. wire. Anchoring winch is G16 hydrographic with 456' of 5/8" cable.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

A laboratory in bridge structure is equipped mainly for fish measuring and biological investigations.

## **HABITABILITY**

No information.

## **OTHER FEATURES**

None.

**TYPE OF OBSERVATIONS**

Fisheries research, mainly young fish surveys, experimental fishing, tagging, etc.

**REMARKS**

None.

# ANTARCTIC EXPEDITION SHIP

## UNNAMED

NO PHOTO AVAILABLE

**TYPE:** Antarctic Research Vessel, steel hull Has ice-breaker stem and cruiser stern. Ice Class I according to Lloyd's Regulations

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1961	68.3m.	12.8m.	5.7m. (full)		1,572.9	734.3

### PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
	13.7		20,000 miles	

### COMPLEMENT

CREW	SCIENTIFIC STAFF
60 (to tal)	



## **AFFILIATION**

Republic of South Africa.

## **PROPULSION**

Ishikawajima-Harima Sulzer, 6TAD 36 diesel engine, 1,560 HP at 300 r.p.m. Single cast steel 4-bladed propeller. Uses "A" heavy oil, tank capacity 543.1 tons.

## **ELECTRICAL POWER**

Adopts 440V AC, 3-phase, 60-cycles for general motors and 3-phase or single phase 110V 60-cycles for other equipment and instruments. Characteristics: 110V DC, 3-phase; and 112V DC and 110V AC single-phase. Equipped with 112 DC emergency generator and storage batteries.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Two radars, JMA-112A and JMA-107CA; gyrocompass and repeater.

Communication - Main transmitter adapts medium wave A1 200W and A2 250W, and short wave A1 300W, while the emergency transmitter employs medium wave A2 40W.

Echosounders No information but presumably well equipped.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has two 5-ton derrick booms, two 10-ton booms and one 3-ton boom.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Considerable space available for laboratories. Has a 12.3 ton distilled water tank.

### HABITABILITY

Fresh water tank capacity 364.8 tons. Has hydrophor type distillation equipment. Special heating system for Antarctica work. All external walls of accomodation facilities are covered with 50 mm. thick glass wool for heat insulation. Vessel is very comfortable.

### OTHER FEATURES

Has a special look-out cabin from which vessel can be operated. Ship equipped with device to inject steam into valve attached to hull and the sea chest, to inject hot water to melt ice cake. Her outer skin, frame, propeller, stem and stern-post are especially reinforced, adopting a peculiar traverse section and stem shape.

### TYPE OF OBSERVATIONS

Oceanographic survey and research in Antarctic area.

### REMARKS

Built in Japan by the Fujinagata Shipbuilding Company. Has dual purpose; designed as Antarctic research vessel during summer, and coastal cargo and passenger carrier the remainder of the year. Has a 10.8 m. Isuzu diesel engine, steel motor boat, which can carry 14 persons or 3 tons of equipment.

**UNION OF SOVIET SOCIALIST REPUBLICS**

**SECTION 59**

# AKADEMIK S. VAVILOV

NO PHOTO AVAILABLE

**TYPE:** Oceanographic Vessel converted from Fishing Trawler (logger).

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1949	38.7 m.	7.2 m.	3.3 m.	400 tons (full)	255.4	68.5

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
8.5	9		3,700 miles	25 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF

## **AFFILIATION**

Institute of Oceanology, Academy of Sciences, USSR.

## **PROPULSION**

Reversible engine without compressor (BUKAU-VOLF), 353 HP. Has single, tri-blade propeller, clockwise rotation. Uses diesel oil; capacity 30 tons.

## **ELECTRICAL POWER**

Ship generates 84 KW, requires 57 KW for normal ship operations, 40 KW DC available for scientific work. Ship has 110V DC; converter can make 220V AC, 2 KW.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - One RDF (SRP-5), one navigation sounder (NEL-4), one hydraulic log (LG-25), one electro-mechanical log (LG5M), one gyro-compass (Course 3), two magnetic compasses (track and main), and a long distance station.

Communication - Ship has radio station with transceiver equipment according to Naval Register of USSR.

Echosounders - Has three: one Kelvin-Hughes and two NEL-5.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One oceanographic trawling winch with two wildcats, two oceanographic windlasses (OKEAN), and special winch for handling TV equipment.

## **ACOUSTICAL CHARACTERISTICS**

Is not capable of acoustical observations.

## **LABORATORIES**

Ship has four laboratories whose functions vary according to cruise requirements.

## **HABITABILITY**

Ship specially adapted for navigation in Sea of Azov and Mediterranean. Carries 25 tons of fresh water; no distillation apparatus. Has fresh and salt water showers.

### OTHER FEATURES

No antirolling devices; ship can make oceanographic observations up to Sea State 4.

### TYPE OF OBSERVATIONS

Meteorological observations, bathymetric series, bottom samples, plankton trawling, and ichthyological studies.

### REMARKS

Crew and scientists quartered in two, three, and four-bed cabins. Captain and chief-engineer have own cabins. Women scientists have made several expeditions aboard vessel.

# MAZIRBE

NO PHOTO AVAILABLE

TYPE: SRT-4576, converted Fishing Vessel, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1958	39.0 m.	7.3 m.	3.2 m.	438 tons (full)	264	93

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
9.8	10.2			30 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
22	4

## **AFFILIATION**

Scientific Research Institute of Fisheries (SNKh) of the Latvian SSR.

## **PROPULSION**

Diesel engine, single fixed-blade propeller, 400 HP. Uses diesel oil, capacity 45 tons.

## **ELECTRICAL POWER**

Ship generates 85 KW and requires about 16 KW for normal operations. Has 220V DC.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass, two magnetic compasses, radar, RDF, and two echosounders.

Communication - Radio station, 250W.

Echosounders - Has one KhAG-240 (Fishlocator), range 1,250 m., equipped with self recorder and electronic marker with electronic ray tube (fish enlarging lens). One EGA-10 for navigation, range 1,200 m., equipped with self recorder and depth indicator with neon lamp. Ping length on instruments is fixed.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has two manual winches of "Thomson" type.

## **ACOUSTICAL CHARACTERISTICS**

Cannot be made noiseless.

## **LABORATORIES**

Has two laboratories.

## **HABITABILITY**

Ship designed to work in temperate latitudes. Carries 25 tons of fresh water; no distillation apparatus; salt water showers available.



#### **OTHER FEATURES**

None. Ship can make observations up to Sea State 4.

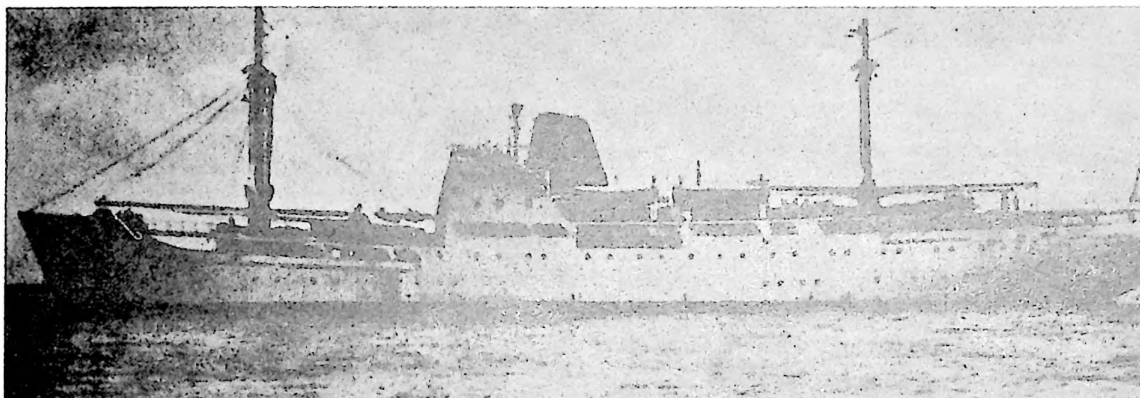
#### **TYPE OF OBSERVATIONS**

Plankton, bottom fauna, commercial fish studies, and hydrology.

#### **REMARKS**

Two women scientists can be accommodated.

# MIKHAIL LOMONOSOV



**TYPE:** Built as Oceanographic Research Vessel, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1957	102.6 m	14.4 m	6.0 m.	5,960 tons		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
13				35 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
62	69

## **AFFILIATION**

Operated by the Academy of Sciences, for the Marine Geophysical Institute, USSR.

## **PROPULSION**

No information.

## **ELECTRICAL POWER**

No information, but believed sufficient to perform any type of research work.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

No information, but believed to have the latest type of navigation and communication equipment. Has at least two echosounders which record to 5,000 m. and 10,000 m. respectively.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has deep water anchor winch with 15,000 m. of cable which allows vessel to anchor in any known depth. Eight hydrographic winches with 10,000 m. of cable. Trawling equipment.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Has sixteen scientific laboratories capable of performing any type of investigation or analysis.

## **HABITABILITY**

Can operate for extended periods in all navigable waters. Quarters and living conditions very fine.

## **OTHER FEATURES**

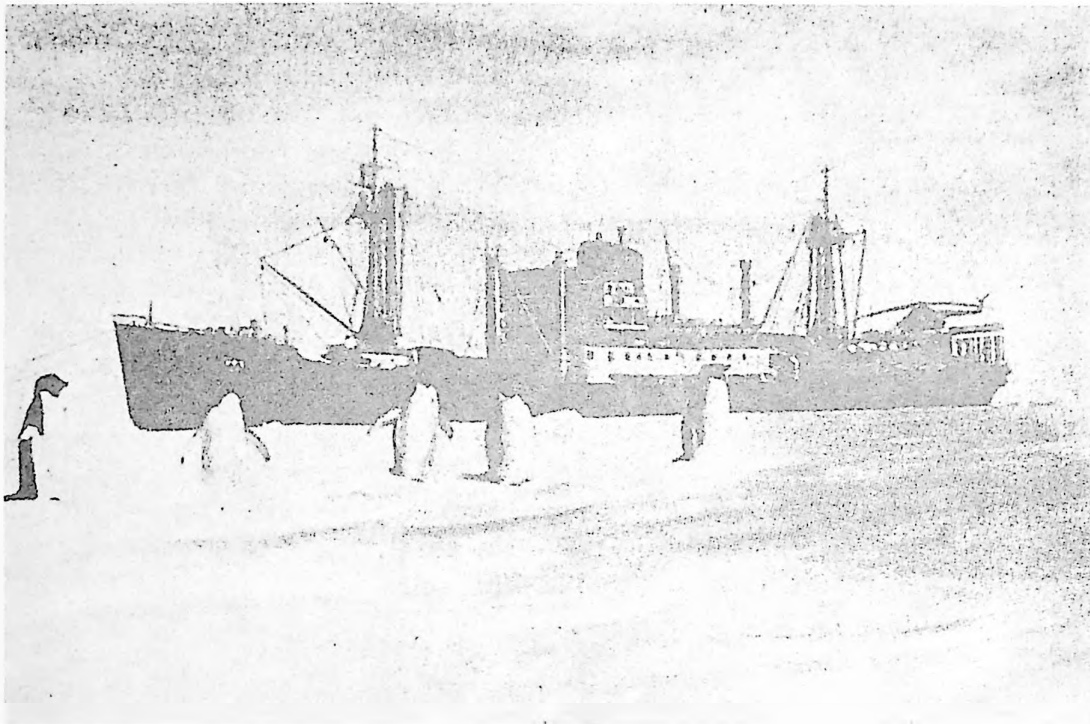
Has helicopter platform with helicopter.

### TYPE OF OBSERVATIONS

All kinds of oceanographic, meteorological, and geophysical observations.

### REMARKS

This is the world's largest ship designed and built for oceanographic work. It probably has more oceanographic gear on board than any other ship afloat. Was built in the Neptun shipyard at Rostock, Democratic Republic of Germany according to specifications supplied by the USSR Academy of Sciences. Has accommodations for women scientists and generally carries women on board as crew members.



**TYPE:** Former Transport Vessel redesigned for scientific research, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1953	130 m.	18.9 m.	7.6 m.	12,000 tons (full)	7,503	4,251

#### PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
	15.5			3 months

#### COMPLEMENT

CREW	SCIENTIFIC STAFF

## **AFFILIATION**

Murman Arctic Marine Shipping Association, USSR.

## **PROPULSION**

Diesel-electric motor, with four diesel generators (Schelde-Zulzer, type 8, MN42), 7,000 SHP, single fixed-blade propeller. Uses diesel oil; capacity unknown.

## **ELECTRICAL POWER**

Has three "Schelde-Zulzer" generators (type 5 VN29) of 255 KW each. "Stoianochnyi" diesel generator of 40 KW, and emergency diesel generator "Lister" of 15 KW. Ship current 220V and 127V DC and 220V and 127V AC, 50-cycle.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Two gyrocompasses (Course-4), two magnetic compasses, log (Gauss-25), and two radar (Zarnitsa and Neptun).

Communication - No information; presumably well equipped.

Echosounders - Has two Kelvin-Hughes MS26 type and two NEL-5 type, range 2,000 m.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Five winches of various sizes of OKEAN type. Large one has 5,000 m. of 4.5 mm. cable, run by 7 KW motor. Also has small BT winch, and double-drum winch for EMIT's (current observation gear) with 200 m. of cable on each drum.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Has geological laboratory consisting of three compartments; an echo-sounding compartment (4 x 6 m.), a separating compartment (5 x 5 m.), and a microgeological compartment (3 x 3 m.). Two hydrological laboratories (3 x 5 m. and 2 x 4 m.) with automatic recorders for thermograph and electromagnetic current meter. Two hydrochemical laboratories (4 x 6 m. each). Meteorological laboratory (2 x 3 m.) and biological laboratory (4 x 8 m.) also available. Electrical current in laboratories is 220V and 127V DC and AC.

### **HABITABILITY**

Ship can operate in tropical as well as polar areas. Carries 1,200 tons of fresh water; distillation capacity is 20 tons/day.

### **OTHER FEATURES**

Hull strengthened for ice navigation. No antirolling devices, ship can make observations up to Sea State 6.

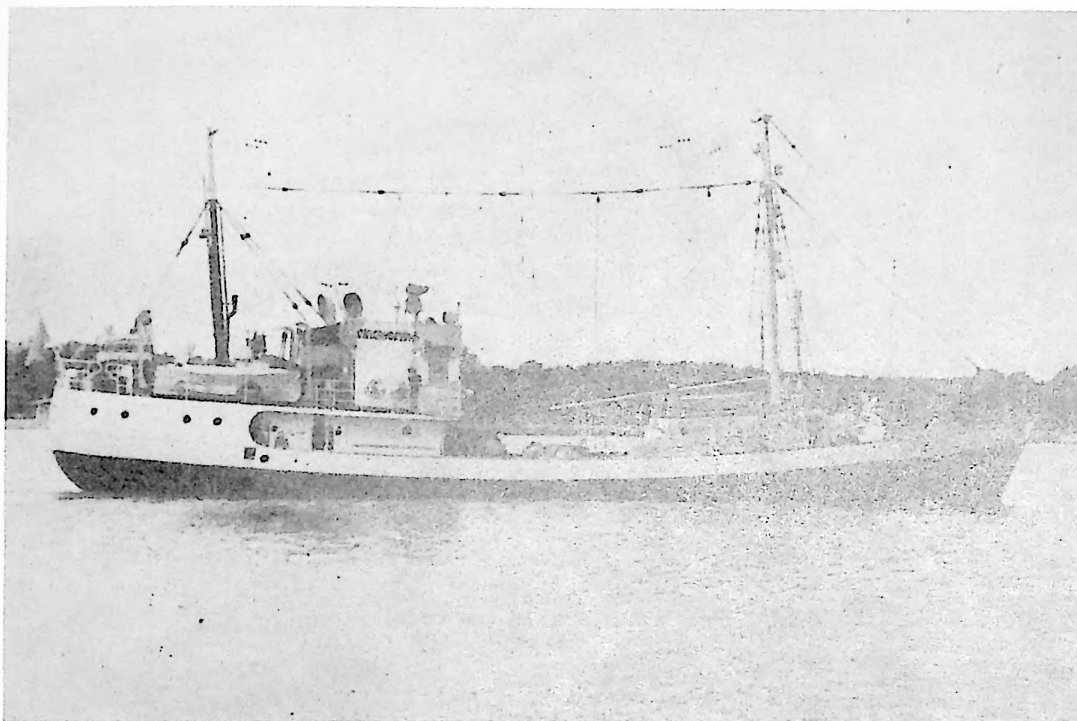
### **TYPE OF OBSERVATIONS**

Depth measurements, all types of bottom work, deep water hydrological investigations, surface currents, meteorological observations, all types of biological investigations, and can take in large quantities of sea water.

### **REMARKS**

Has club room, music room, smoking lounge, and facilities for steam baths.

# OKEANOGRAPH



**TYPE:** Fishing Trawler, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1958	38.5 m.	7.4 m.	3.0 m. (full)	426.4 tons (full)	264.8	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
8.0	9.5			30 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
20	9



## **AFFILIATION**

The Leningrad branch of the State Oceanographic Institute.

## **PROPULSION**

Diesel motor, one tri-blade fixed propeller, 300 HP. Uses diesel fuel; capacity 52 cu. m.

## **ELECTRICAL POWER**

Ship generates 77.5 KW and requires about 36 KW for normal ship operations. Has 220V and 24V DC available. Has accumulators and transformers for other current requirements.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass (small caliber Amur type), magnetic compasses, two electromechanical logs, manual mechanical sounding instrument (Thomson type), echosounding instrument (PFT), radar, and RDF.

Communication - Main radio station, all-wave transmitter and receiver, 100W. Emergency receiver. Has automatic feeder of SOS and danger signals, and automatic receiver of danger signals.

Echosounders - Has EGA-10 echosounder, magnetic, with two recording instruments (recorder and depth indicator). Depth indicator has two scales, 0 to 100 m. and 0 to 1,200 m. Recorder has following ranges: 0 to 400 m., 400 to 800 m. and 800 to 1,200 m.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Two electric hydrographic winches with 1,200 m. of 3.6 to 4 mm. tapered wire. An electrical winch for electromagnetic current meter, with 200 m. of cable. Three cranes. Deep water anchoring equipment run by electric winch with 1,000 m. of 24 mm. cable.

## **ACOUSTICAL CHARACTERISTICS**

Hydroacoustical investigations have not been carried out.

## **LABORATORIES**

Chemical laboratory (5.7 sq. m.) and hydrological laboratory (5.75 sq. m.). The laboratories have 220V and 24V DC.

### **HABITABILITY**

Ship adapted for work in temperate and northern latitudes; also beyond Arctic Circle. Carries 44.4 cu. m. of fresh water.

### **OTHER FEATURES**

Hull strengthened for ice navigation. Can navigate in broken ice after an icebreaker.

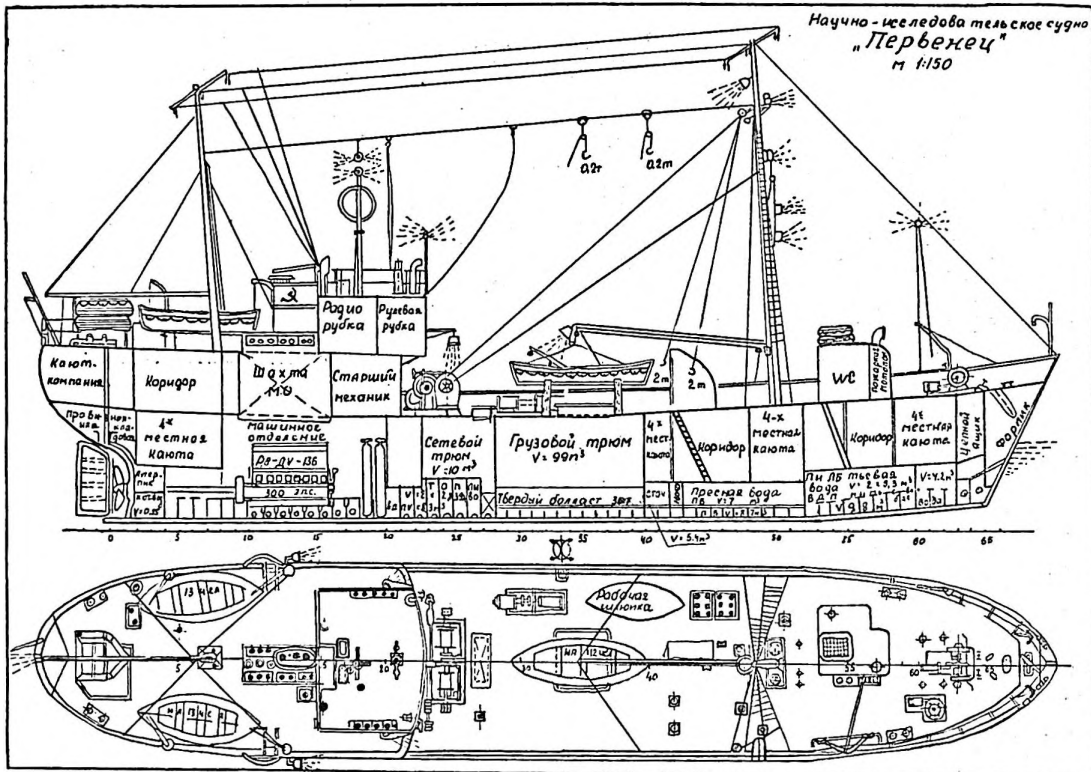
### **TYPE OF OBSERVATIONS**

Ship equipped with facilities for: measuring wind force and direction, air and water temperature measurements, electromagnetic current meter for current speed and direction, wave graph recordings of height and period of waves while ship is drifting or at anchor.

### **REMARKS**

Can make all complex hydrometeorological observations.

# PERVENETS



**TYPE:** Fishing Trawler refitted for scientific research, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1956	39.2 m.	7.3 m.	3.4 m. (full)	442.0 tons (full)	238.9	67

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
9.5				21 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
23	13

## **AFFILIATION**

The Administration for the Projected Commercial Investigation of the Far East (TINRO) for the City of Vladivostok.

## **PROPULSION**

Has four-cylinder, noncompression, reversible, simple acting, diesel motor (Type R8-DV-136), 300 HP, with single fixed-blade propeller. Uses diesel fuel; capacity about 36 tons.

## **ELECTRICAL POWER**

Ship generates 93.4 KW, uses 12.5 KW for normal ship operations. For scientific work, 20.9 KW available. Has 220V, 73.5 KW, and from batteries 24V, 360 amp.-hrs.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Radio direction finder (ORP-1), radar (Stvor), magnetic compasses, and sound emitting instrument (Tifon).

Communication - Main transmitter (Ersh-R); frequency range of medium waves from 365 to 550 KC, short waves 1500 to 2400 KC. Main receiver wave range from 24 to 2100 m. Emergency receiver (APS-3-0), and emergency receiver (PAS-1m.) 400 to 550 KC. Automatic transmitter of alarm signals (AKSTI-50). Short wave receiver (12 to 200 m.), and boat radio station (ARSh-3).

Echosounders - Has two echosounders, Type NEL-5r, with maximum range of 1,000 m. One oceanographic echosounder (Nippon Electric Co.), range to 5,000 m.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has large hydrographic winch (type OKEAN), 18.5 KW, located amidships and small 2.8 KW winch.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Has hydrological (8 sq. m.) and ichthyological (6.5 sq. m.) laboratory. Electricity available.

### **HABITABILITY**

Ship can operate in tropical or polar regions. Carries 42.8 tons of fresh water; no distillation apparatus.

### **OTHER FEATURES**

Hull strengthened to permit navigation in broken ice. Has bilge keels; can make observations up to Sea State 6 or 7.

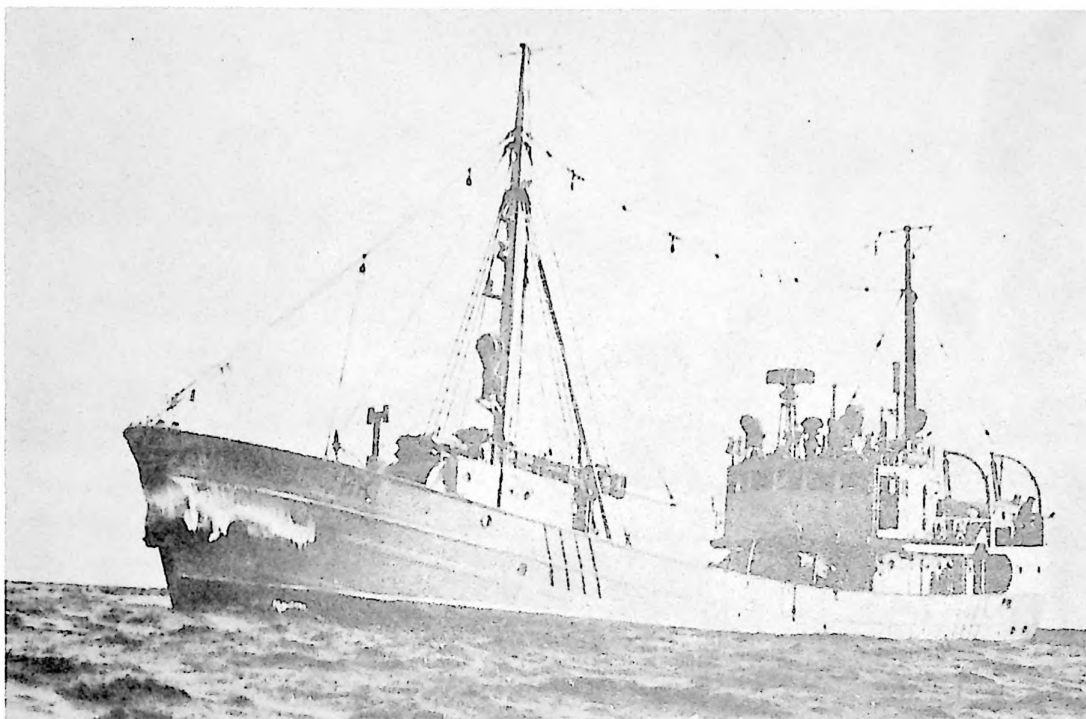
### **TYPE OF OBSERVATIONS**

Hydrological, hydrobiological and geological (bottom sediment) observations, depth measurements, and ichthyological investigations.

### **REMARKS**

None.

# POLIARNIK



**TYPE:** Fishing Trawler, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1952	38.5 m.	7.4 m.	3.1 m. (full)	446.5 tons (full)	261.1	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
8.0	9.5			30 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
20	10

## **AFFILIATION**

The Murmansk Administration of Hydrometeorological Service.

## **PROPULSION**

Diesel motor, one tri-blade fixed propeller, 300 HP. Uses diesel fuel; capacity 53.7 cu. m.

## **ELECTRICAL POWER**

Ship generates 69 KW, uses about 20 KW for normal ship operations. Has 220V and 24V DC available. Has accumulators and transformers for other current requirements.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass (Course-3), magnetic compasses, mechanical log (Askaniia) and two electromechanical logs (type LNZ), manual mechanical sounding instruments (type ZShP), NEL-5 echosounder, radar (Neptun), and RDF (SRP-5).

Communication - Main radio station has 60W transmitter and receiver. Emergency radio station also has a 60W transmitter and receiver.

Echosounders - Echosounding instrument NEL-5, magnetic with two recording instruments (recorder and depth indicator), transmitting contact relay to 2,000 m. Accuracy of depth indicator 3%, of recorder 3.5%.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Two electric hydrographic winches with 1,200 m. of 3.8 to 4 mm. tapered wire located amidships. Three cranes. Deep water anchoring equipment, electric, with 1,000 m. of 24 mm. cable.

## **ACOUSTICAL CHARACTERISTICS**

Hydroacoustical investigations have not been carried out.

## **LABORATORIES**

Chemistry laboratory (7.3 sq. m.), hydrological laboratory (8.7 sq. m.) and photo laboratory (3.1 sq. m.). All laboratories have 110V and 24V DC.

### **HABITABILITY**

Ship adapted for work in temperate and northern latitudes; not suited for tropical work. Carries 40.4 cu. m. of fresh water.

### **OTHER FEATURES**

Hull strengthened for ice navigation. Can navigate in broken ice after an icebreaker.

### **TYPE OF OBSERVATIONS**

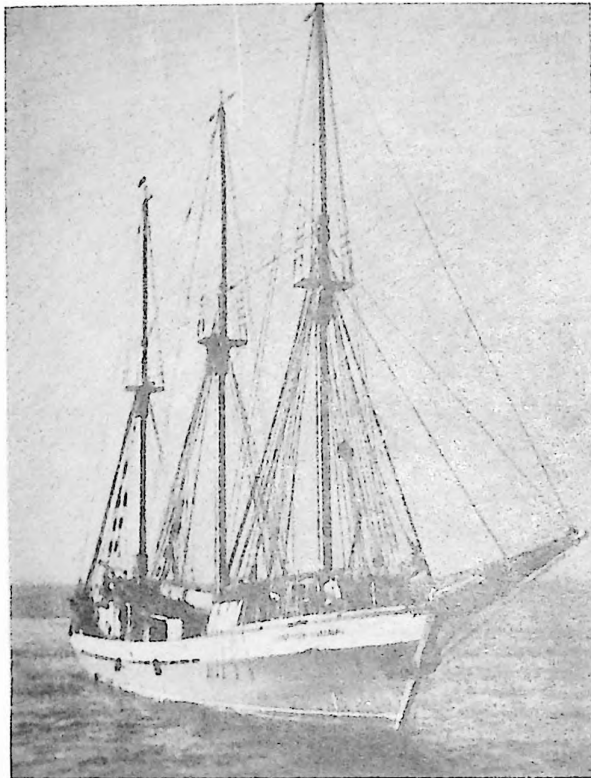
Ship equipped with facilities for: measuring wind force and direction, air and water temperature measurements, electromagnetic current meter for current speed and direction, and wave graph recording of height and period of waves while ship is drifting or at anchor.

### **REMARKS**

Can make all complex hydrometeorological observations.



## PROFESSOR RUDOVITS



**TYPE:** Sailing Motor-Schooner, wooden hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1952	39.4 m.	9.0 m.	3.5 m. (full)	626 tons (full)	328.5	

### PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
6.5	8			18 days

### COMPLEMENT

CREW	SCIENTIFIC STAFF
22	6

## **AFFILIATION**

The Leningrad branch of the State Oceanographic Institute.

## **PROPULSION**

Diesel motor and sails, 200 HP. Has single tri-blade fixed propeller. Uses diesel fuel; capacity 110 cu. m.

## **ELECTRICAL POWER**

Ship generates 8 KW, requires about 3.5 KW for normal ship operations. Has 110V DC. Transformers feed required currents to instruments.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Magnetic compasses (type GU-127 mm. and type Lyth), and mechanical log (type Cherub ).

Communication - Valtion-Sohkopaja transmitters, short wave types LLW-10W, medium wave types LN-100W, accident type AT-51-50W. Nalvar-Valtion-Sohkopaja receiver, all-wave RHY-102A-1.5W, and long wave WL46.5W.

Echosounders - No information, but believed to have several on board.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has five manual winches with 300 m. of 4 mm. cable each. Also has five cranes located in various places aboard ship. Has deep water anchoring device with 500 m. of cable.

## **ACOUSTICAL CHARACTERISTICS**

Hydroacoustical investigations have not been made.

## **LABORATORIES**

Has dark room (4.8 sq. m.), scientists' workroom (4.0 sq. m.), with 110V and 24V electrical current.

## **HABITABILITY**

Ship adapted for work in temperate latitudes during summer. Carries 24 cu. m. of fresh water.

## **OTHER FEATURES**

None.

### TYPE OF OBSERVATIONS

Ship equipped with facilities for: measuring wind force and direction, air and water temperature measurements, electromagnetic current meter for current speed and direction, and wave graph recordings of height and period of waves while ship is drifting or at anchor.

### REMARKS

Can make all complex hydrometeorological observations.

# SEVASTOPOL

NO PHOTO AVAILABLE

**TYPE:** Big Fishing Trawler KRERNE type, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1951	73.7 m.	11.8 m.	5.8 m. (full)	2,447.4 tons (tons)	937.4	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
12	10	4		60-100 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
66	26

## **AFFILIATION**

Polar Scientific Research Institute of Sea Fisheries and Oceanography, USSR.

## **PROPULSION**

Diesel engine, one fixed-blade propeller, 1,080 HP. Uses diesel oil; capacity 532 cu. m. Sails can be used.

## **ELECTRICAL POWER**

Auxiliary diesel dynamo of 105 HP and 60 KW mounted to secure light and normal work of scientific instruments. Has two 100 KW dynamos. Has 220V DC. Scientific equipment requiring AC arranged together with converter for necessary voltages and frequencies.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Two magnetic compasses (Askania type and GU-127 mm), gyrocompass (Amur), ship log (GOM-4), and radar (Stvor).

Communication - Radio station for long and short waves, and radio-telephone.

Echosounders - Has four types: NEL-4, NEL-5, Hughes MS26, and Fathometer "Skorpion."

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Three light winches (LG-100, type OKEAN) for plankton, BT, and small bottom samples, 5,000 m. each. Stern winch type LG-1200-VNIRO. Seven-ton trawling winch on main deck, used for anchoring up to 1,000 m. and for heavy instruments. All winches electrically operated.

## **ACOUSTICAL CHARACTERISTICS**

Cannot be put in noiseless condition.

## **LABORATORIES**

Five laboratories, each with running fresh and salt water and electrical outlets. These include a hydrological (7 sq. m.), geological (10 sq. m.), hydrochemical (7 sq. m.), biological (10 sq. m.), and microbiological laboratory. Also has long distance meteorological station and equipment for radiosonde.

### **HABITABILITY**

Ship can operate in tropical or polar (in weak ice) areas. Carries 550 tons of fresh water; no distillation apparatus; salt water showers available.

### **OTHER FEATURES**

Bow reinforced for ice navigation. No antirolling device. Ship has good stability; can make observations up to Sea State 6 or 7.

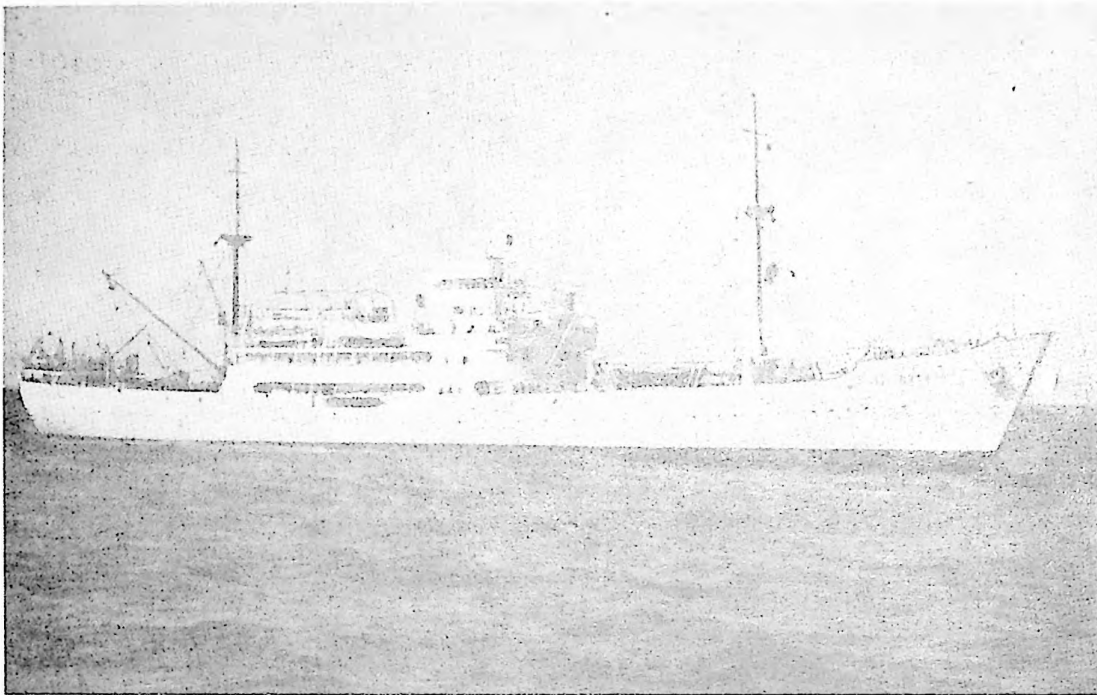
### **TYPE OF OBSERVATIONS**

Bathymetry, bottom samples, temperature, water samples and analyses, plankton, benthos, ichthyofauna, microbiological, meteorological, actinometric, and aerological observations.

### **REMARKS**

Women scientists generally on board. Refitted for oceanographic work in 1957.

# VITIAZ



**TYPE:** Oceanographic Vessel (converted from a cargo-transport), steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1939	109.4 m	14.6 m	5.9 m.	5,710 tons	2,975.5	1,649.3

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
13	14.7	4	17,500 miles	3 months

## COMPLEMENT

CREW	SCIENTIFIC STAFF
64	73

## **AFFILIATION**

Institute of Oceanology, Academy of Sciences, USSR.

## **PROPULSION**

One single action reversible, two-cycle engine (KRUPP type), without compressor, 3,600 IHP. Has a single, four-blade, variable pitch, propeller. Uses diesel oil; capacity 832 tons.

## **ELECTRICAL POWER**

Ship generates 554 KW, requires 178 KW for normal ship operations, about 278 KW available for scientific work. Ship has 220V DC. Converter for 12 KW to 220V AC, 50-cycle. According to requirements, electrical energy in the laboratories transformed into various frequencies and voltages by means of portable equipment.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Two gyrocompasses (Course 3, Course 4), three magnetic compasses (2 track, 1 main), one hydraulic log (Gauss-25), one electro-mechanical log, two radiolocators (DON and NEPTUN), one Kelvin-Hughes navigation log, two RDF (SRP-5 and Millard), and two long distance meteorological stations.

Communication - Ship has a radio station with transmitters and receivers that, according to the USSR Naval Register, allows her to travel anywhere.

Echosounders - Two Kelvin-Hughes, range to 10,000 m. Two Kelvin-Hughes, range to 4,500 m. One fishlocator (Kingfisher).

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has eight lightweight oceanographic winches (OKEAN) with 10,000 m. of cable, lift power of 800 kg. One anchoring windlass with 12,500 m. of cable, traction resistance 18 tons. One deep water trawling winch with 12,500 m. of cable, traction resistance 7.3 tons. One oceanographic trawling winch with two wildcats. One deep water board windlass (GOL-55) with 12,000 m. of cable, lift power 1.5 tons.

## **ACOUSTICAL CHARACTERISTICS**

Ship cannot be made completely "quiet," but has performed seismo-acoustical work to determine bottom sediment thickness.



## LABORATORIES

There are fourteen laboratories for hydrological, meteorological, chemical, and biological investigations. All laboratories are equipped with the required standard equipment.

## HABITABILITY

Prepared for work in tropical and sub-Arctic zones; however, no air-conditioning. Carries 713 tons of fresh water; distillation capacity 10 tons/day. Salt and fresh water showers available.

## OTHER FEATURES

No antirolling devices, but ship will behave well under stormy conditions. Deep water anchor allows ship to anchor in depths up to 32,810 ft.

## TYPE OF OBSERVATIONS

All oceanographic observations and research can be performed except those requiring "quiet" ship. Following fields generally represented by approximately 60 scientists on board: meteorology, hydrology, hydrooptics, hydrochemistry, geology, geochemistry, bottom fauna, plankton, primary production, ichthyology, radiometry, and instrumentation.

## REMARKS

Flagship of the USSR oceanographic fleet. Very comfortable quarters. Has a dormitory with beds for 32 men, and dining facilities for 48 men. Also has lounge, with space for table games and movies. Sixty-three cabins with 1, 2, or 4 beds, 36 of them for crew and rest for scientific personnel. Women scientists frequently accommodated. Ship converted for research in 1948. One of the largest and most versatile oceanographic vessels of the world.

# ZARIA

NO PHOTO AVAILABLE

**TYPE:** Wooden hulled, three-masted sailing Schooner, non-magnetic.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
	131'	32.5'		580 tons (light)		

## PERFORMANCE

SPEED (knots)		RANGE	ENDURANCE
CRUISING	MINIMUM		
6.5 with sails 9 with engine		3,500 miles	

## COMPLEMENT

CREW	SCIENTIFIC STAFF
25	9

## **AFFILIATION**

Institute of Terrestrial Magnetism, Moscow.

## **PROPULSION**

Main engine 300 HP. Gaff-type sails with total area over 700 yards.

## **ELECTRICAL POWER**

No information.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

No information.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

No information.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

No information.

## **HABITABILITY**

Capable of operations in all ice-free waters.

## **OTHER FEATURES**

All equipment, such as electric motors and some scientific instruments, placed so as to offer least possible magnetic interference.

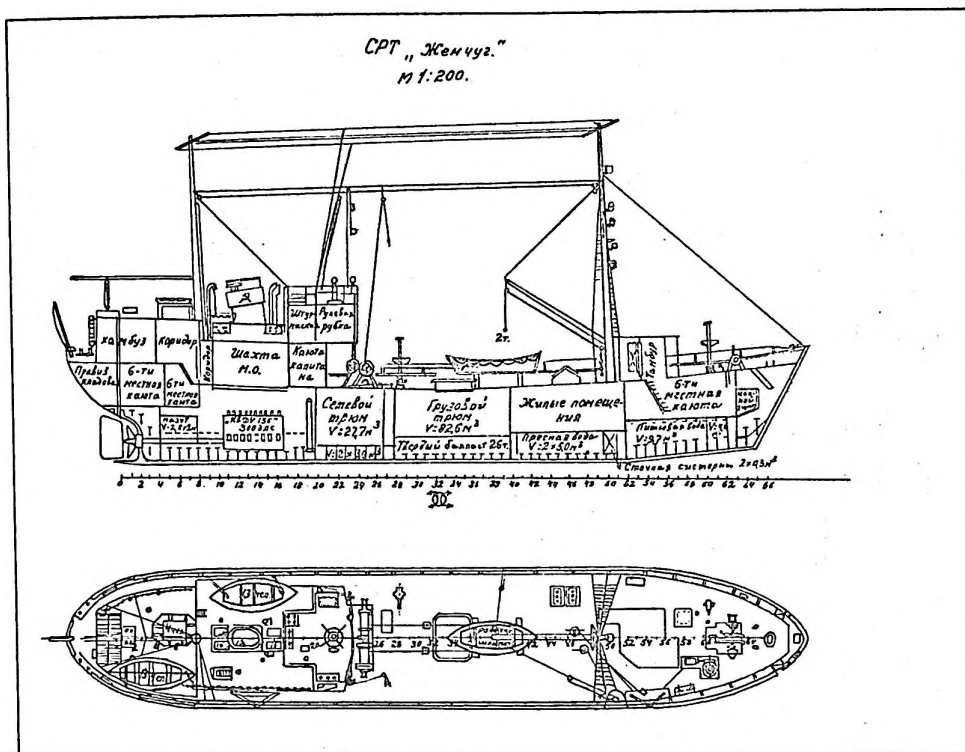
## **TYPE OF OBSERVATIONS**

Besides magnetism, ship performs oceanographic investigations, collects meteorological data, and makes observations of ionospheric conditions.

## REMARKS

The only non-magnetic oceanographic survey ship in operation at the present time. Hull is wood with a minimum of built-in iron and steel, brass and copper-bronze alloys were used wherever possible. Outfitting and instrumentation was done by Soviet scientists after ship had been constructed in Finland under Russian supervision.

# ZHEMCHUG



**TYPE:** Fishing Trawler refitted for scientific research, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1950	39.2 m.	7.3 m	3.1 m (full)	422.6 tons (full)	239.4	62.5

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
9	10.5			23 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
23	11

## **AFFILIATION**

The Administration for the Projected Commercial Investigation of the Far East (TINRO) for the City of Vladivostok.

## **PROPULSION**

Has a Bakau Volf, four-cylinder, non compression, reversible motor (Type R-8DV136), 300 HP, with single fixed-blade propeller. Uses diesel fuel. Capacity 36 tons. Sails may also be used.

## **ELECTRICAL POWER**

Ship generates 82.4 KW, uses about 12.5 KW in normal ship operations. Has 20.9 KW available for scientific work. Has three 110V sources of 57 KW, 12.5 KW and 4.5 KW. Also has 24V, 162 amp.-hrs. from batteries.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Two radar sets (Stvor and Donets), RDF (SRP-5), ship log (AMZ), magnetic compasses, and sound emitting instrument (Tifon).

Communication - Main transmitter (PARKS-0.08) wave lengths 600, 661, 706, 732 m. Main receiver (PR-4p), 150 to 1800 m. Emergency transmitter (ASP-0.06) and emergency receiver (PAS-1). Also has short wave receiver (PARKS-0.08), wave lengths 48, 31, 72, and 46 m. and short wave receiver (PR-4p), wave ranges from 25 to 150 m.

Echosounders - Has two Type NEL-5r, with maximum range of 2,000 m. Ping length cannot be changed.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has two light-weight winches of 2.8 KW. One located on the bow and other amidships. Trawling winch, amidships, 24 KW, 4-ton traction force, for bottom samples and anchoring at great depths. Plankton winch, starboard bow, 15.5 KW, traction force of 2 tons, also available.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Has two laboratories: hydrological (8 sq. m.) and ichthyological (6.5 sq. m.) laboratory. Each has running water and electricity.

### **HABITABILITY**

Ship can operate in tropical and polar regions. Carries 42 tons of fresh water; no distillation apparatus; salt water showers available.

### **OTHER FEATURES**

Has strengthened hull for navigation through broken ice. With bilge keels ship can make observations up to Sea State 6 or 7 and sometimes 8.

### **TYPE OF OBSERVATIONS**

Bathymetry, bottom sediments and samples, hydrological samples, and plankton and ichthyological investigations.

### **REMARKS**

Ship equipped with hydro-acoustical station (Paltus), range 2,000 m. Women scientists may be accommodated.

## A. OTKUPSHCHIKOV

NO PHOTO AVAILABLE

**TYPE:** SRT-440 (denotes medium fishing trawler) of German construction.  
Steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1950	38 m.	7.3 m	2.7 m. bow 3.0 m. stern	239 full 178 light	440	350

### PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
7.5	9.0	0.5		30 days

### COMPLEMENT

CREW	SCIENTIFIC STAFF
20	6



## **AFFILIATION**

Polar Scientific Research Institute of Sea Fisheries and Oceanography (PINRO).

## **PROPULSION**

Buckaw Wolf diesel 300 HP engine. Single screw propeller with fixed pitch blade. Uses diesel fuel, reserve 45-50 tons for 1.5 months.

## **ELECTRICAL POWER**

Equipped with 2 generators. Direct current only.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Electronic log, radar, radio direction finder, (2) magnetic compasses, (2) automatic meteorological stations SDS (voice frequency terminating equipment. Tr.).

Communication - Ship's radio station.

Echosounding - One HEL-4 to 500 m. and one El. FRG to 1,250 m.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Two hydrological winches (plankton winch on stern, hydrological on bow), and one trawling winch.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

One multipurpose laboratory, 2.5 x 3.5 m. for hydrological and hydrobiological research.

## **HABITABILITY**

Vessel not adaptable to tropical or polar regions. Best suited for northern seas that are free of ice. Fresh water reserves 36 tons.

## **OTHER FEATURES**

No antirolling devices. Ship can operate to Sea State 6.

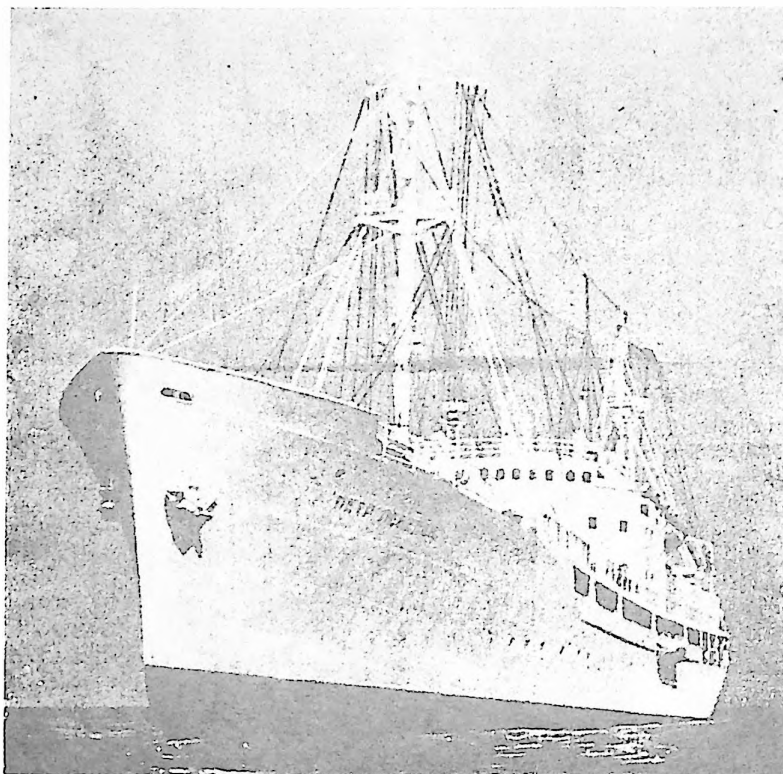
### **TYPE OF OBSERVATIONS**

The entire complex of oceanographic observations; magnetic and seismic observations cannot be carried out.

### **REMARKS**

Ship was re-fitted in 1951 for scientific oceanographic investigations in the Barents Sea.

# PETR LEBEDEV



**TYPE:** Former Cargo Steamer converted to research ship.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1960 (refitted)	94 m.	14 m.	5.3 m.	4,600 tons		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
	13	0-5 w/anti-drift device		45-50 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF

## **AFFILIATION**

Academy of Sciences, USSR.

## **PROPULSION**

Single-shaft diesel screw "Sulzer" engine, 2,400 HP.

## **ELECTRICAL POWER**

Has AC diesel generators to supplement the DC supply.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Ship has modern navigation equipment for long independent navigation and for carrying out synoptic work with other Soviet vessels.

Communication - No information but presumably well equipped.

Echosounding - No information but presumably well equipped.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Forward deck winch for geological and hydrological work with cable sufficient for any ocean depth; one 2 ton winch with 2,000-2,500 m. of cable for biological trawling. On the forward and boat decks contact reels with load capacity 250 kg. for working multi-strand cables are installed for lowering electronic instruments to 250-300 m. Light hydrological winches with 1,200 m. of wire on port and starboard in stern of ship.

## **ACOUSTICAL CHARACTERISTICS**

Performs acoustical studies.

## **LABORATORIES**

Laboratories for general hydrology, oceanic biology, sound dissipation, hydrochemistry and oceanic geology. Also has facilities for calibration, repair of electronic gear and a dark room.

## **HABITABILITY**

Air-conditioned. Capable of research in any region of the world oceans which is ice free.

## OTHER FEATURES

Ship equipped with special "steering correction" and "anti-drift" devices. Fram-Makarov roll stabilizers give vessel a roll period of from 14 to 24 sec. Helicopter can land on deck.

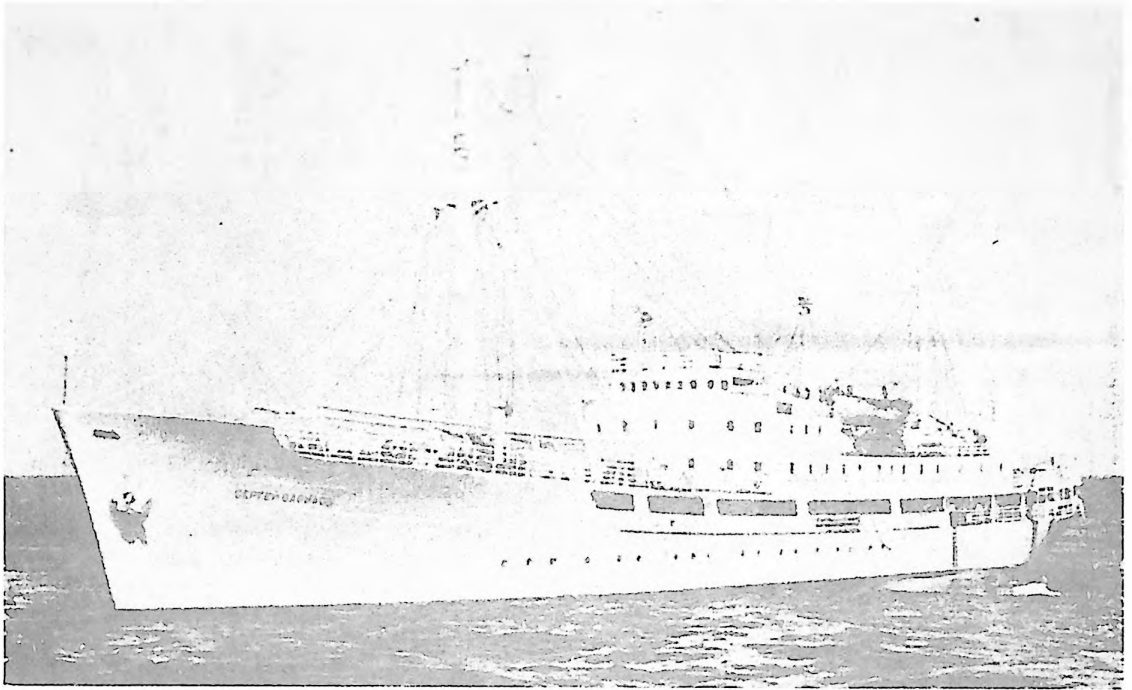
## TYPE OF OBSERVATIONS

All types of physical, geological, and biological oceanography. Carries various floating and anchored buoys with radio-telemetric equipment having ranges up to 50 miles.

## REMARKS

Named after the Russian physicist, Petr Levedev. Ship carries sea-going roadstead launch on forward deck. Conversion of this vessel was made along with the SERGEY VAVILOV with synoptic oceanography the objective. Both vessels are equipped with a considerable amount of radio navigation and communication apparatus. Also the radio-telemetric buoys extend the capabilities of these ships to perform synoptic investigations.

# SERGEY VAVILOV



TYPE: Former Cargo Steamer converted to research ship.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1960 (refitted)	94 m.	14 m.	5.3 m.	4,600 tons		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
	13	0-5 w/anti-drift device		45-50 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF

## **AFFILIATION**

Academy of Sciences, USSR.

## **PROPULSION**

Single-shaft diesel screw "Sulzer" engine, 2,400 HP.

## **ELECTRICAL POWER**

Has AC diesel generators to supplement the DC supply.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Ship has modern navigation equipment for long independent navigation and for carrying synoptic work with other Soviet vessels.

Communication - No information but presumably well equipped.

Echosounding - No information but presumable well equipped.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Forward deck winch for geological and hydrological work with cable sufficient for any ocean depth and one 2 ton winch with 2,000-2,500 m. of cable for biological trawling, and for lowering deep-water electronic measuring instruments. On the forward and boat decks contact reel with load capacity 250 kg. for working multi-strand cables are installed for lowering electronic instruments to 250-300 m. Light hydrological winches with 1,200 m. of wire on port and starboard in stern of ship.

## **ACOUSTICAL CHARACTERISTICS**

Performs acoustical studies.

## **LABORATORIES**

Laboratories of non-uniformity of the surface layer, study of the surface of the ocean, sounds and noises in the ocean, telemetric measurements with radio-buoys, and general hydrology. Also has facilities for calibration, repair of electronic gear and a dark room.

## **HABITABILITY**

Air-conditioned. Capable of research in any region of the world oceans which is ice free.

## **OTHER FEATURES**

Ship equipped with special "steering correction" and "anti-drift devices." Fram-Makarov roll stabilizers give vessel a roll period of from 14 to 24 sec. A small KA-18 helicopter is based on board.

## **TYPE OF OBSERVATIONS**

All types of physical, geological, and biological observations. Carries various floating and anchored buoys with radio-telemetric equipment having ranges up to 50 miles.

## **REMARKS**

Named after the Russian physicist, Sergey Vavilov. Ship carries sea-going roadstead launch on forward deck. Conversion of this vessel was made along with the PETR LEBEDEV with synoptic oceanography the objective. Both vessels are equipped with a considerable amount of radio navigation and communication apparatus. Also the radio-telemetric buoys extend the capabilities of these ships to perform synoptic investigations.



# TOPSEDA

NO PHOTO AVAILABLE

**TYPE:** SRT-18 (denotes medium fishing trawler) of German construction.  
Steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1950	38 m.	7.3 m.	2.7 m. bow 3.0 m. stern	239 full 178 light	440	350

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
7.5	9.0	0.5		greater than 30 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
20	6

## **AFFILIATION**

Polar Scientific Research Institute of Sea Fisheries and Oceanography (PINRO).

## **PROPULSION**

Buckaw Wolf diesel 300 HP engine. Single screw propeller with fixed pitch blade. Uses diesel fuel, reserve 45-50 tons for 1.5 months.

## **ELECTRICAL POWER**

Equipped with 2 generators. Direct current only.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT.**

Navigation - Electronic log, radar, radio direction finder, (2) magnetic compasses, (2) automatic meteorological stations SDS (voice frequency terminating equipment. Tr.).

Communication - Ship's radio station.

Echosounding - One HEL-r to 500 m. and one El. FRG to 1,250 m.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Two hydrological winches (plankton winch on stern, hydrological on bow), and one trawling winch.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

One multipurpose laboratory, 2.5 x 3.5 m. for hydrological and hydro-biological research.

## **HABITABILITY**

Vessel not adaptable to tropical or polar regions. Best suited for northern seas that are free of ice. Fresh water reserves 59 tons.

### **OTHER FEATURES**

No antirolling devices. Ship can operate to Sea State 6.

### **TYPE OF OBSERVATIONS**

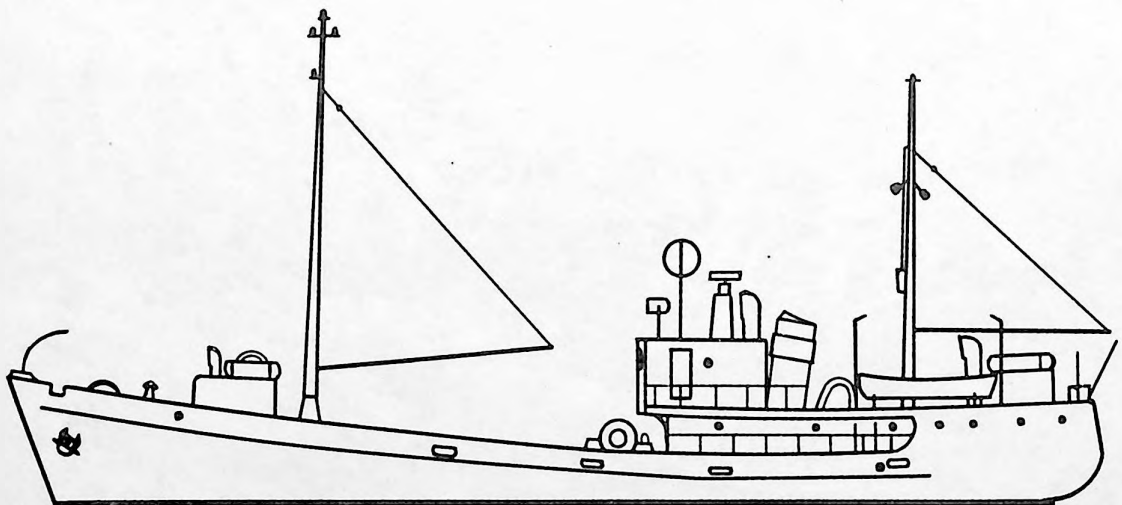
The entire complex of oceanographic observations; magnetic and seismic observations cannot be carried out.

### **REMARKS**

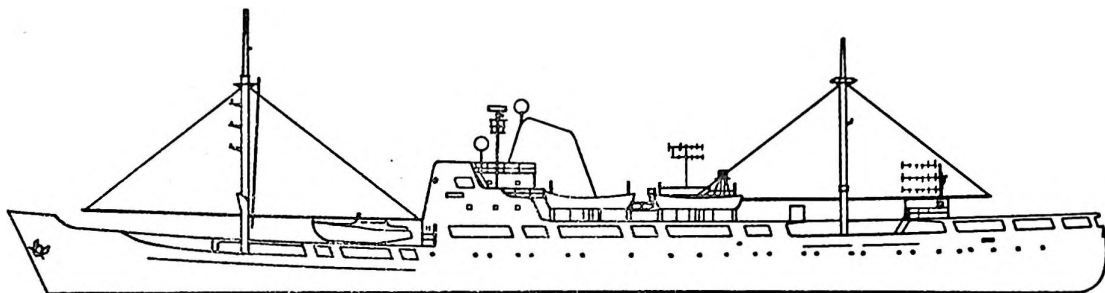
Ship was re-fitted in 1955 for scientific oceanographic investigations in the Barents Sea.



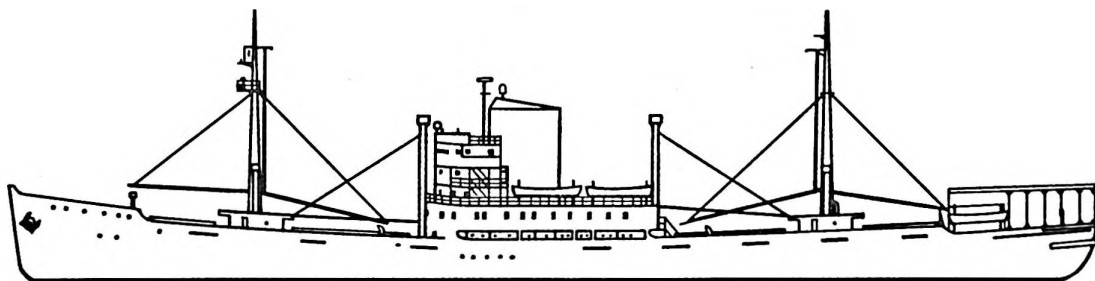
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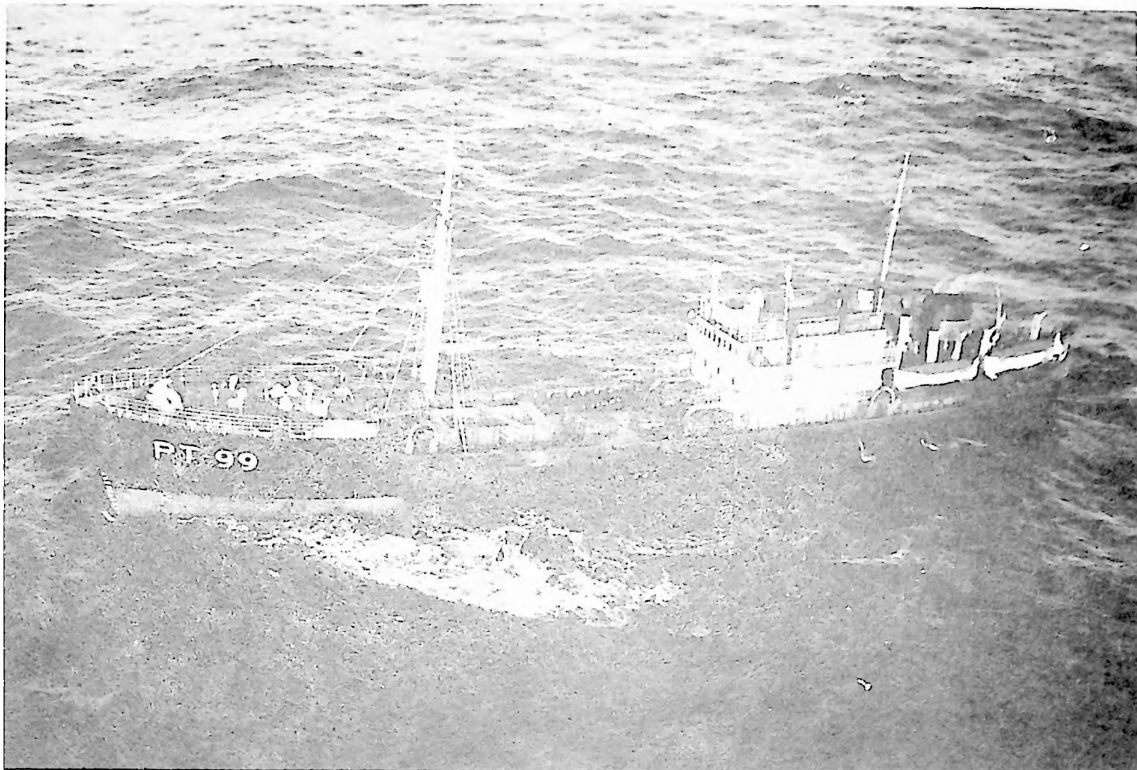
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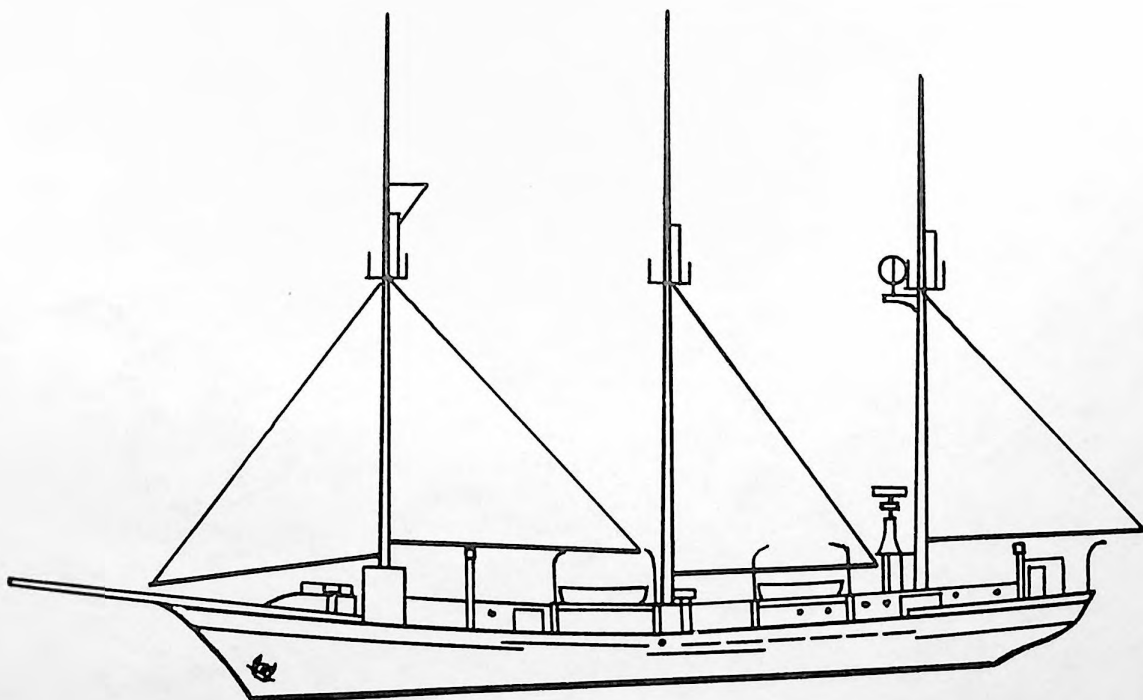
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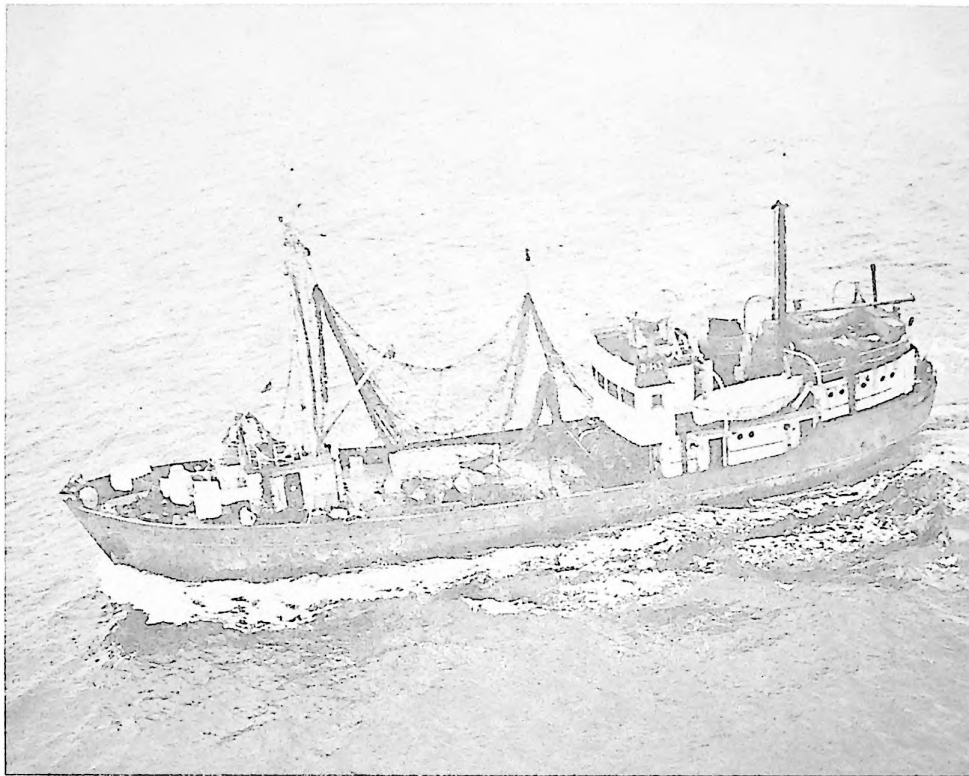
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NOVOROSSISK (RT-99) sister to SEVASTOPOL, paste on page 59.25



ZARIA, paste on page 59.31



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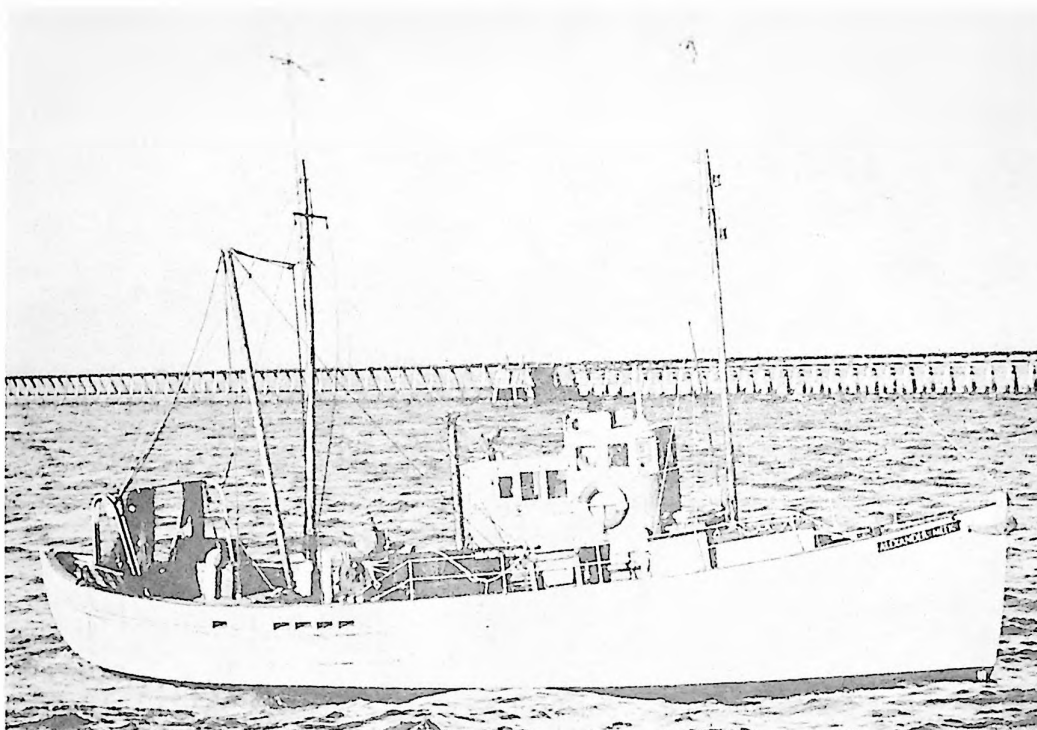
BURTON ISLAND, paste on page 62.16

**UNITED KINGDOM**

**SECTION 61**



# ALEXANDER MEEK



**TYPE:** Modified Scottish east coast Seine Netter.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
	53'	16'3"	5'11"	25.7 tons		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
9	10		800 miles	

## COMPLEMENT

CREW	SCIENTIFIC STAFF
3	3

## **AFFILIATION**

Dove Marine Laboratory, Cullercoats, King's College, Newcastle, University of Durham.

## **PROPULSION**

Gardner diesel, 95 HP.

## **ELECTRICAL POWER**

Has 24V DC, 1 KW.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Decca system loran, radar, radio RT coastal 85/MK with transmitting frequencies of 130-142 MC and receiving frequencies of short, medium and long. Kelvin-Hughes MS20 echosounder.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One hydrographic winch fitted to run off main winch through gear box with 1,800' of 1/8" wire. Main trawl winch is J. W. West Mark IV with 1,200' of 3/8" wire on each side.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

One laboratory located amidship; approximately 9' x 9'.

## **HABITABILITY**

No information, presumably limited to local nearshore work.

## **OTHER FEATURES**

None.

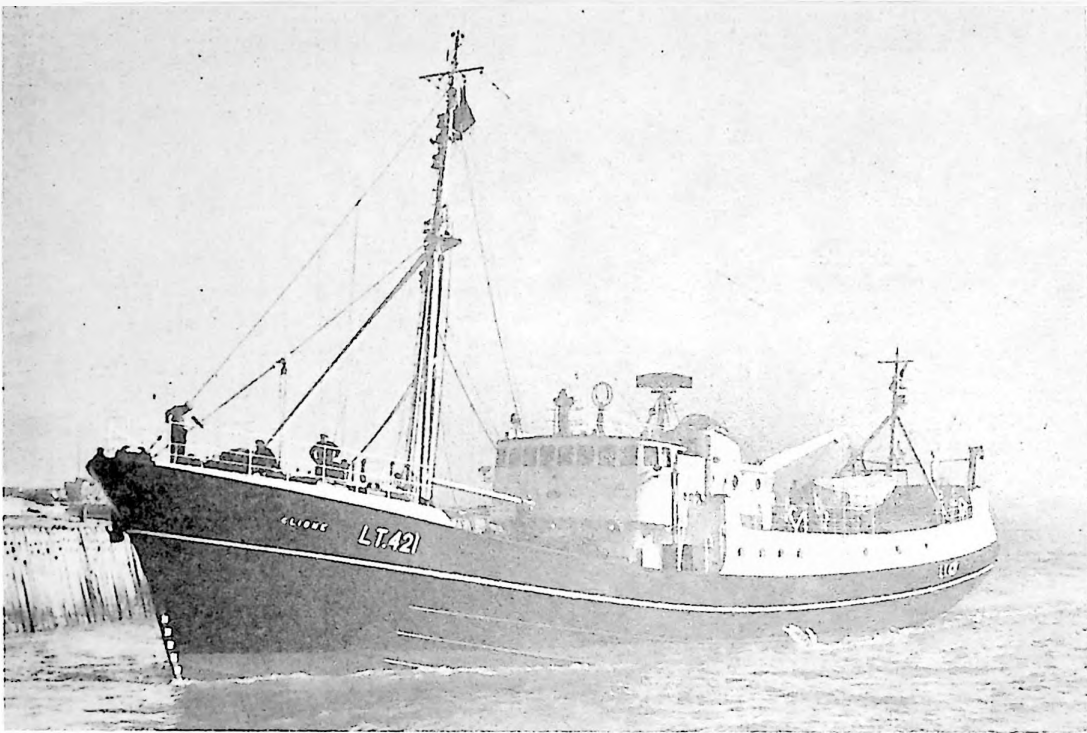
## **TYPE OF OBSERVATIONS**

Oceanographic and marine biological research.

**REMARKS**

Also used for instruction of University students.

# CLIONE



**TYPE:** Motor ship, steel hull, built as a near and middle waters Research Trawler.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1961	139.6'	29'	15' (full)	781 tons (full)	495.9	130.0

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
	12	1/4		24 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
23	5

## **AFFILIATION**

Ministry of Agriculture, Fisheries and Food; Fisheries Laboratory, Lowestoft, Suffolk.

## **PROPULSION**

Diesel engine, single screw with propeller assisted rudder. Has 960 BHP. Uses Gasoleum.

## **ELECTRICAL POWER**

Ship generates 440 KW, normal ship operations require maximum of 210 KW. Available for scientific work, 25 KW, 240V AC, 50-cycle. No battery supply.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Direction finder receiver (Marconi Gannet; Marconi Lodestone to be fitted), radar (Decca 505), gyrocompass (S.G. Brown) magnetic compass (Henry Brown and Son), log (Sal 58), electronic navigational systems (Decca navigator including track plotter).

Communication - Marconi Fulman transmitter and Marconi Atalanta receiver.

Echosounders - Two Kelvin-Hughes MS29F, 0-450 fms., AC synchronous motor, ping 1/2, 1, and 2 milliseconds, 30 KC. One Kelvin-Hughes Fisherman's Asdic MK I.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

All winches made by Elliott and Garrood. Trawl winch, electric, 260 BHP, with 2,200 m. of 2-7/8" steel warp on each of two drums. Hydrographic winch, electric, 125 HP, with 5,000 m. of 4 mm. wire. Pelagic winch, electric, 45 HP, with 640 m. of 2" steel wire on each of two drums. Plankton and grab winch, electric, 75 HP, with 730 m. of 1" wire. Two cable winches, electric, 4 HP, have 10-way slip ring assembly with changeable drums each holding 730 m. of 5/8" cable.

## **ACOUSTICAL CHARACTERISTICS**

Ship cannot be made noiseless.

## **LABORATORIES**

There are three laboratories, with electrical power, and gas or compressed air cylinders available if required. Main laboratory, (190 sq. ft.), chemical analysis, data processing, chart work, instrumentation. Deck laboratory (90 sq. ft.), Nansen bottle series, BT, fish measuring and otolithing, plankton sample processing, preparation of gear. Electronics laboratory (105 sq. ft.), fish echosounding techniques, temperature-depth recordings, GEK, continuous recording of sea surface temperature, and transparency; center well located here.

## **HABITABILITY**

Ship best suited for temperate and sub-Arctic zones. Carries 54 tons of fresh water. No salt water showers.

## **OTHER FEATURES**

Has center well. Has 35-ton capacity center tank for carrying 20 tons of live fish, fitted with pump to aerate water. Pleuger Active Rudder fitted. Bilge keels allow operations up to wind force 6-7.

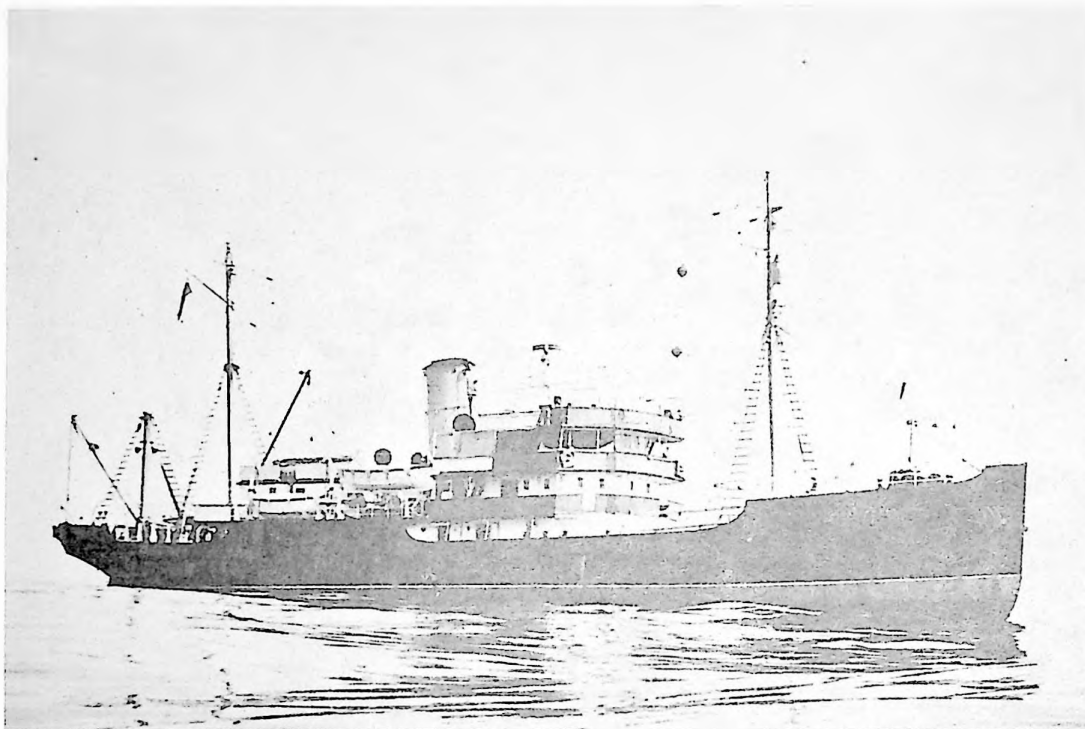
## **TYPE OF OBSERVATIONS**

Fish population, plankton and benthos samples, hydrographic series, underwater photography, echosounding (to 420 fms.), currents, temperature-depth recording, GEK, transparency, continuous surface temperature.

## **REMARKS**

Ship's name is Latin for a pelagic gastropod.

## DISCOVERY II



**TYPE:** Steel hulled steamship designed and built as a Research Vessel.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1929	234'	36'	17' (full)	2,100 tons (full)	1,065	327

### PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
9	13	1-1 1/2	7,000 miles	48 days

### COMPLEMENT

CREW	SCIENTIFIC STAFF
38 (Total)	

## **AFFILIATION**

National Institute of Oceanography.

## **PROPULSION**

Steam, triple-expansion, 1,250 HP, single screw (built up). Uses Bunker "C" oil. Has emergency sails.

## **ELECTRICAL POWER**

Ship generates 96 KW, 45 KW required for normal ship operation and 6 KW available for scientific work. Main ship supply 110V DC, 96 KW; scientific supply 230V AC, 50-cycle, 6 KW.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyro and magnetic compasses, electric log, radar, radio direction finder, Decca navigator, loran.

Communication - Marconi "World Span" transmitter and receiver, Marconi "Reliance" emergency transmitter and receiver, Marconi "Gannet" R/T transmitter and receiver. Transmitting frequencies, 410-512 KC and 2-22 MC. Receiving frequencies, 15 KC-25 MC.

Echosounders - Kelvin-Hughes types 21B, 21E, and 26E and precision depth recorder of National Institute of Oceanography design.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One steam-driven hydrographic winch forward with 6,500 m. of 4 mm. wire. One steam-driven hydrographic and bouy winch amidship (2 drums) with 1,200 m. of 4 mm. wire and 12,000 m. of 2 mm. wire. One steam-driven oceanographical winch aft with 6,500 m. of 4 mm. wire. One electric BT winch aft. One combined steam-driven trawling, dredging, and coring winch aft (2 drums), main drum has 9,100 m. of tapered steel wire (1-1/2" to 1-3/4"), auxiliary drum has 2,000 m. of 1-1/2" steel wire.

## **ACOUSTICAL CHARACTERISTICS**

Cannot be put in noiseless condition.

## **LABORATORIES**

Has eight laboratories, a general laboratory, a chemical laboratory, two "wet" deck laboratories, a geophysics laboratory, a photo and dark room, a scientific workshop and a net workshop and store.



### **HABITABILITY**

Not suitable for tropical work. Carries 168 tons of fresh water and has adequate distillation facilities.

### **OTHER FEATURES**

Class I ice strengthening only. No antirolling devices. Ship can usually work in winds and seas up to 6 Beaufort.

### **TYPE OF OBSERVATIONS**

Water sampling, bottom sampling (coring, dredging), trawling, bottom photography, deep current measurements, and underway observations (PDR, gravity, magnetic, surface temperature, seismic, BT, and fish detection).

### **REMARKS**

None.

# ERNEST HOLT



**TYPE:** Steam Ship, steel hull, originally designed and built as a distant waters Research Trawler.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1948	176.6'	30.2'	17.5'	1,000 tons (normal)	599.3	182.5

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
10-1/2	12	3		18 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
24	6

## **AFFILIATION**

Ministry of Agriculture, Fisheries and Food, Fisheries Laboratory, Lowestoft, Suffolk.

## **PROPULSION**

Steam reciprocating engine, single screw, 900 BHP. Uses light marine boiler fuel oil and medium fuel oil. Carries 210 tons, uses about 8-1/2 tons/day.

## **ELECTRICAL POWER**

Ship has two steam turbo-generators producing 80 KW and one diesel generator producing 15 KW. Normal ship operation requires about 30 KW. Available for scientific work, 50 KW maximum excluding diesel generator. Currents available: 110V DC, 50 KW and 230-250V AC, 50-cycle, 12 KW. No battery supply.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Direction finder receivers (Marconi Lodestone and Guardian), radar (Marconi Radiolocator, Mark IV), gyrocompass and course recorder (S. G. Brown), magnetic compass (Kelvin-Hughes), log (Chernikeef Improved Submerged Log), electronic navigational systems including track plotter (Decca Navigator).

Communication - Transmitters - Marconi Globespan and Marconi Transarctic. Receivers - Marconi Atalanta, Marconi C. R. 300/2, and Marconi 93. A Marconi Dynatron is also available.

Echosounders - Has two Kelvin-Hughes MS29F, 0-450 fms., AC synchronous motor, ping length 1/2, 1, 2 milliseconds, 30 KC. One carries scale expander cathode ray tube display. Has one Kelvin-Hughes MS21E, 0-2,200 fms., DC governor controlled motor, 10 KC. Has one Marconi Fishgraph, 0-700 fms. DC governor controlled motor, ping length 1.5 milliseconds, 48 KC. Has one Pye Fishfinder, 0-300 fms., variable frequency oscillator timebase, 1/2 millisecond pulse, 30 KC, cathode ray tube presentation only.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Trawl winch (C. D. Holmes and Co., Ltd.) steam, 275 HP. Carries two trawl warps of 1,450 m. each. Center barrel in two sections carries 1,000 m. of 1-1/4" to 3/4" wire. Hydrographic winch (Elliott and Garrood) carries 5,000 m. of 4 mm. wire. Plankton winch (Elliott and Garrood) carries 1,200 m. of 4 mm. wire. Transducer towing winch carries 1,200 m. of 3/8" cable, has automatic safety release if strain of towing increases beyond safe limit for cable. Portable, hand-operated cable reeling drum carrying 650 m. of 1/2" cable and fitted with 10-way slip ring assembly can also be carried if required.

## ACOUSTICAL CHARACTERISTICS

Ship cannot be made noiseless.

## LABORATORIES

Four laboratories on board, all have electrical power, and gas or compressed air can be carried if required. General laboratory (150 sq. ft.) for chemical analysis, data processing, chart work, etc. Deck laboratory (125 sq. ft.) for fish measuring and otolithing, plankton sample processing, preparation and repair of instruments, etc. Hydrographic laboratory (105 sq. ft.) for Nansen bottle series, BT lowerings, current measurements. Electronics laboratory (40 sq. ft.) for fish detection and echosounding techniques, temperature-depth recordings, GEK. Meteorological station not included under laboratories.

## HABITABILITY

Unsuitable for tropics, built for Arctic work. Carries 58 tons of water in boiler feed tanks and 43 tons of water in domestic tanks.

## OTHER FEATURES

With bilge keels can operate in wind force 6-7. Has scientific freezer space. Ice strengthened.

## TYPE OF OBSERVATIONS

Fish population sampling, hydrographic series, plankton sampling, continuous surface temperature, echosounding to 2,200 fms. benthos sampling, sea state recording, currents, underwater photography, BT, and GEK.

## REMARKS

Named after a pioneer in North Sea fisheries investigation whose work in the 1890's provided foundation for this branch of science.

# MANIHINE

NO PHOTO AVAILABLE

**TYPE:** Originally designed as a Steam Trawler, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1906	110'	21'	12.3'		208.5	113.3

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
8-1/2	9-1/2	3	4,500 miles	30 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
18	3

## **AFFILIATION**

East African Marine Fisheries Research Organization.

## **PROPULSION**

Two diesel engines, twin fixed-blade screws. Carries 31-1/2 tons of Mobil diesel.

## **ELECTRICAL POWER**

Ship generates 32 KW, requires 16 KW for normal ship operation, has 16 KW available for scientific work. Current 110V DC.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Compasses, echosounder.

Communication - Clipper R/T set (Woodsons), range 350-400 miles. Voice transmission frequencies 2182, 4114, 4411, 5680, 8255.2 KC.

Echosounders - Marconi Seagraph (600 fms.), accuracy controlled by centrifugal governor.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Trawl winch, two drums, each with 300 fms. of 1/2" wire. Hydrographic winch with 2,500 m. of 4 mm. wire.

## **ACOUSTICAL CHARACTERISTICS**

Slight vibration during sailing. Speed reduction has not been reached.

## **LABORATORIES**

One general purpose laboratory with running hot and cold fresh water, seawater and electrical outlets.

## **HABITABILITY**

Carries 33 tons of fresh water, no distillation apparatus. Presumably capable of local operations only.

#### **OTHER FEATURES**

None. No antirolling devices. Ship can make hydrographic observations up to Sea State 6 and plankton tows up to Sea State 5.

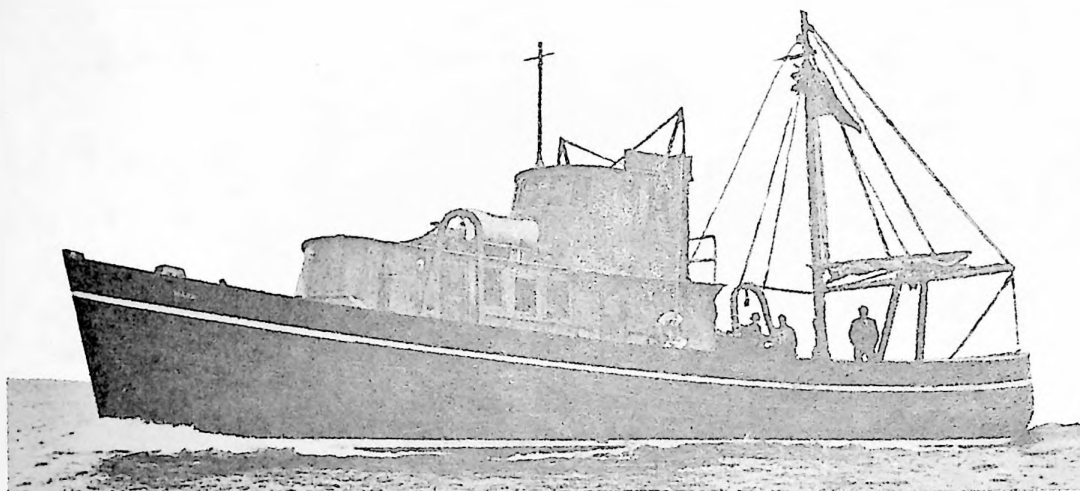
#### **TYPE OF OBSERVATIONS**

Trawling and plankton tows.

#### **REMARKS**

Generally operates in East African waters.

# MARA



TYPE: Seiner

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1938	73'	20.2'	9'			

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		

## COMPLEMENT

CREW	SCIENTIFIC STAFF
8	3



## **AFFILIATION**

Research vessel of the Fisheries Division, Scottish Home Office.

## **PROPULSION**

Powered by 204 BHP Ruston 6 VCBM engine driving Slack and Parr variable pitch propeller through 2:1 reduction gear.

## **ELECTRICAL POWER**

Two 10 KW generators, one automatically voltage-regulated and driven off fore-end of main engine; other is part of the three-in-line set. A 230V AC converter supplies power for scientific equipment.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation equipment consists of Decca navigator and track plotter, "Seafarer" coastal radio and directional finder. Two Kelvin-Hughes echo-sounders aboard, an MS29 white line recording instrument in wheelhouse and MS26 in deck laboratory.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Five-speed combination winch (Miller) driven directly off fore end of main engine. Each trawl barrel holds 600 fms. of 1-1/2" circumference warp.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Has one deck laboratory.

## **HABITABILITY**

No information. Presumably limited to local nearshore work.

## **OTHER FEATURES**

Has special instruments to record accurately the drag of the trawl, its speed and the spread of the wires. An automatic camera mounted on the back of the trawl is sometimes installed.

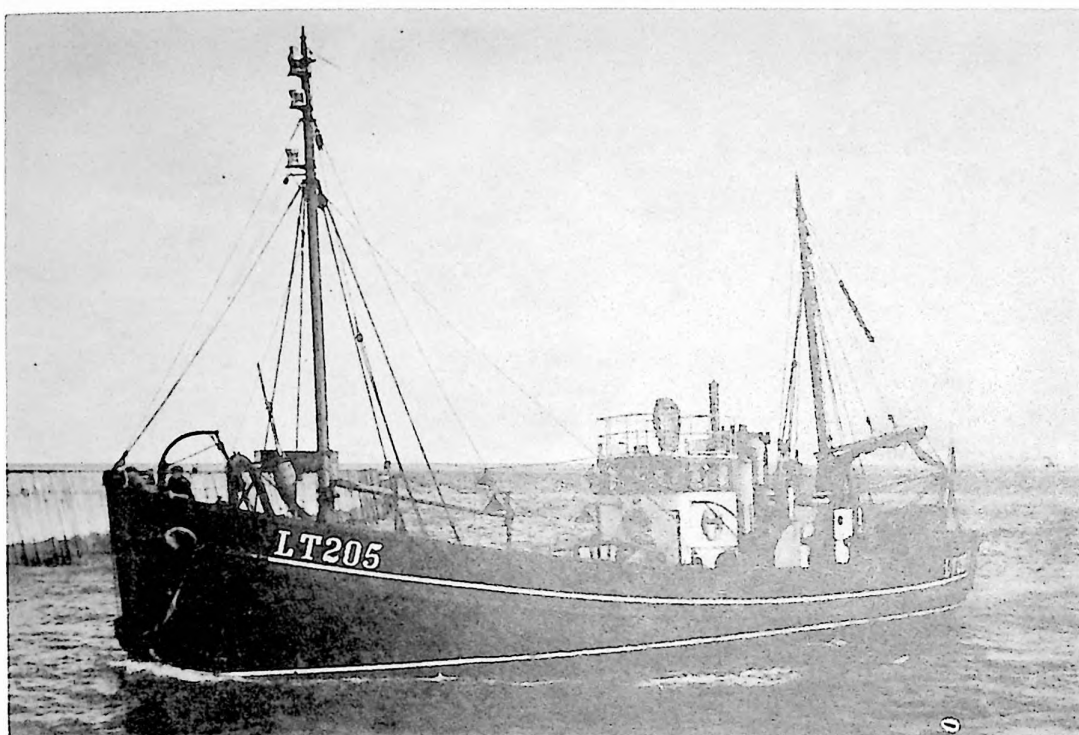
**TYPE OF OBSERVATIONS**

Used primarily for fisheries research.

**REMARKS**

None.

# PLATESSA



**TYPE:** Adapted Admiralty 90-foot Motor Fishing Vessel, wood.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1946	88'	22'	11'	200 tons	112.2	47.6

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
8.3		1		12 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
11	4

## **AFFILIATION**

Ministry of Agriculture, Fisheries and Food, Fisheries Laboratory,  
Lowestoft, Suffolk.

## **PROPULSION**

Diesel engine, single screw, 240 BHP. Uses Gas oil, about 200 gal. per day. Also has a mizzen sail.

## **ELECTRICAL POWER**

Ship generates 12.5 KW and requires about 6.5 KW for normal operations, leaving about 6 KW for scientific work. Currents available: 220V DC, 6 KW and 24 V, 150 amp.-hrs. from batteries.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Direction finder (Marconi Guardian), magnetic compass, Taffrail log, electric navigational system (Decca Navigator), radar (Marconi Consort).

Communication - Radio-telephone (Marconi Albatross).

Echosounders - One Kelvin-Hughes MS29F, 0-450 fms., AC synchronous motor, 1/2, 1, 2, millisecond ping, 30 KC. One Marconi Seagraph II, 0-250 fms., DC governor controlled motor, 2 milliseconds ping, 24 KC.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One main trawl winch and two others, one for hydrographic and plankton work and one for electric cables; can be fitted as required. Trawl winch (Elliott and Garrood) belt driven from main engine, carries 370 m. of 2-1/2" steel trawl warp on each of two drums. Hydrographic and plankton winch, hand driven (gear ratio 20:1), carries 300 m. of 4 mm. wire. Cable winch, fitted with 10-way slip-ring assembly, carries 550 m. of 15/32" cable.

## **ACOUSTICAL CHARACTERISTICS**

Ship cannot be made noiseless.

## **LABORATORIES**

One laboratory on board (40 sq. ft.) used for plankton sample processing, preparation of gear, writing up observations, etc.

#### **HABITABILITY**

Built for use in temperate zones only. Carries 3.6 tons of fresh water, no distillation, no showers.

#### **OTHER FEATURES**

Bilge keels, can operate up to wind force 5.

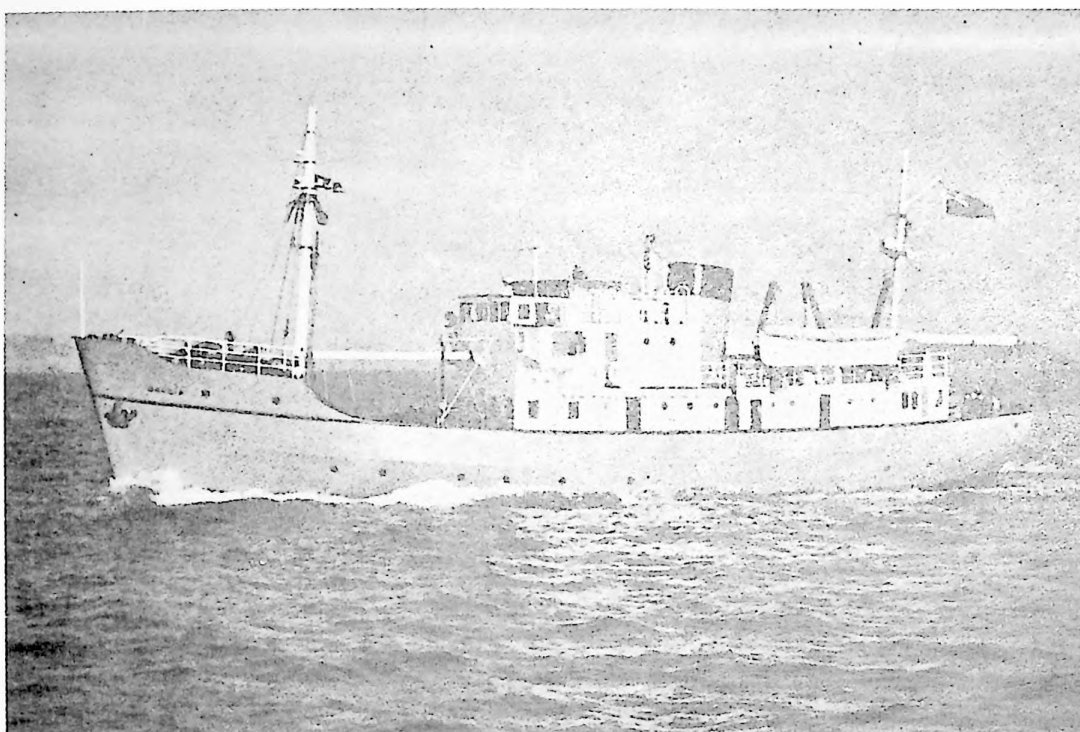
#### **TYPE OF OBSERVATIONS**

Fish population studies, plankton and benthos samples, hydrographic series (shallow water), soundings to 450 fms., current measurements.

#### **REMARKS**

Ship name is Latin for a plaice.

# SARSIA



**TYPE:** Motor Trawler, built for scientific research, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1953	128'	28'	9-1/2' (mean)		319	95

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
8-1/2	10	controllable	4,000 miles	22 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
19	4

## **AFFILIATION**

The Plymouth Laboratory of the Marine Biological Association of the United Kingdom.

## **PROPULSION**

Vertical four-stroke cycle, single acting diesel engine (National R4 AUM6), 290 BHP. Single four-fixed-blade propeller.

## **ELECTRICAL POWER**

Has two diesel generators, one 60 KW, 220V and one 35 KW, 220V. Vessel fitted throughout with 220V DC. Rotary converter incorporated in layout and change-over switch isolates necessary circuits from ship's internal supply system. Also has banks of batteries, each producing 36V, capacity 100 amp.-hrs.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Standard compass, radar (Unit Type 12), electric log (Walkers "Trident"), electric rudder indicator, engine revolution indicator, Decca navigator, and Decca radar receiver.

Communication - Redifon radio-telephone and engine-room telegraph.

Echosounders - Two Kelvin-Hughes echosounders (Type MS26B, 0-720 ft. or fms. and Type MS26E 0-2,250 fms.) and one Marconi "Graphette" echosounder.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Main hydrographic winch, hydraulically operated, carries 5,000 m. of 4 mm. wire. Aft hydrographic winch, hydraulic, with two drums, one carrying 500 m. of 4 mm. wire and the other 300 m. of 7 mm. wire. Elliott and Garrood trawl winch with three drums. Center and star-board drum carry 500 fms. of 2-1/2" wire and port drum carries 1,800 fms. of 1-3/8" wire. Has Reid electric windlass and 5-ton derrick.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Has two laboratories and an oceanographic storage room. Forward laboratory for general-purposes is 14-1/2' by 8-1/2'. Has hot and

cold fresh water, cold salt water, and electrical outlets. Has vacuum pump-compressor. Aft laboratory for chemical work, also used as dark room.

#### **HABITABILITY**

Presumably capable of operating in all ice-free waters. Has facilities for fresh and salt water showers. Has heating system and ventilating fans.

#### **OTHER FEATURES**

For auxiliary propulsion at low speeds a 20 HP variable speed electric motor geared to propeller shaft through main gearbox. Speeds of 0-3 knots may be obtained in calm weather.

#### **TYPE OF OBSERVATIONS**

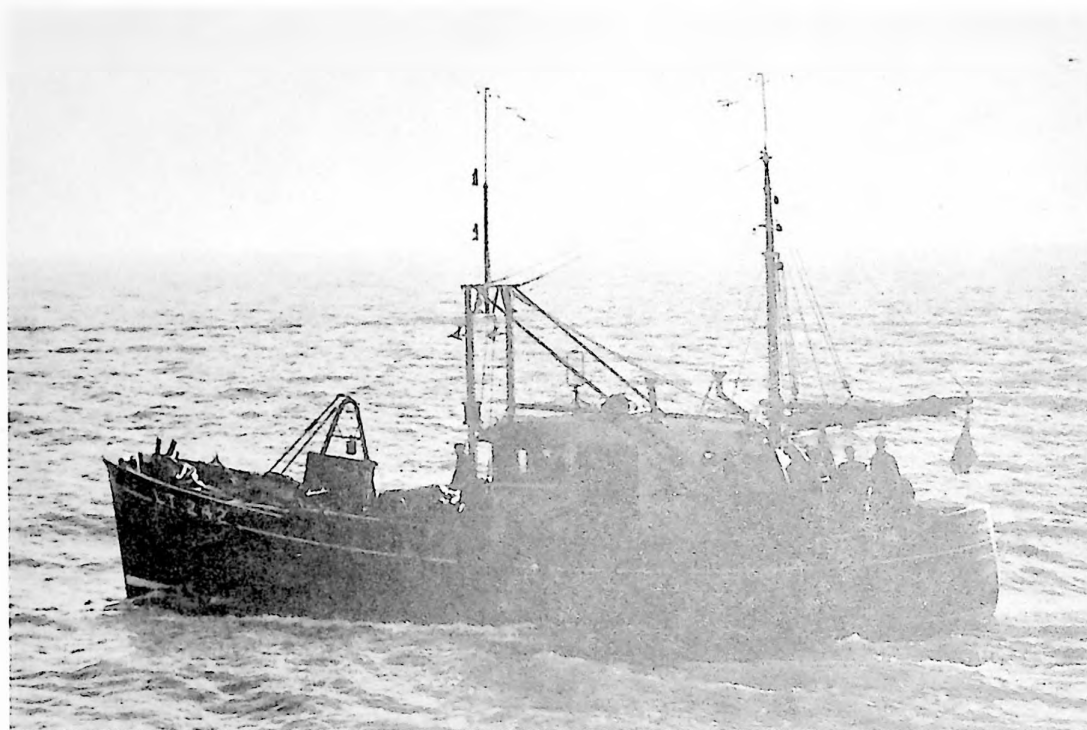
Hydrographic casts, dredging, trawling, soundings, and biological research.

#### **REMARKS**

This ship replaced the SALPA and SABELLA formerly used by the Plymouth Laboratory.



# TELLINA



**TYPE:** Motor Fishing Vessel, built as Research Ship, wood.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1960	55'	17.6'	7'3"	118.5 tons	39.4	16.4

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
8-1/2		1/2		3 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
6	2

## **AFFILIATION**

Ministry of Agriculture, Fisheries and Food, Fisheries Laboratory,  
Lowestoft, Suffolk.

## **PROPULSION**

Diesel-engine, single screw with variable pitch control, 114 BHP.  
Uses Gas oil or medium marine diesel, about 72 gal./day.

## **ELECTRICAL POWER**

Ship generates 11.25 KW and requires about 2 KW for normal operation, leaving about 9 KW for scientific work. Currents available: 110V DC, 5 KW; 240V AC, 50-cycle, 6.25 KW. Has two banks of batteries each supplying 24V. Capacity of these acid batteries, 120 to 300 amp.-hrs.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Direction finder receiver (Marconi Gannet II), magnetic compass, Taffrail log, electric navigational system (Decca Navigator).

Communication - Radio-telephone (Marconi Gannett).

Echosounders - One Kelvin-Hughes MS29F, 0-450 fms., AC synchronous motor, 1/2, 1, 2, millisecond ping, 30 KW.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has main trawl, portable hydrographic, and portable cable winches. Trawl winch (Macduff Engineering Co.) hydraulic drive with power from main engine, carries 275 m. of 1/2" steel trawl warp on each of two drums. Hydrographic and plankton winch, hand driven (gear ratio 20:1), holds 300 m. of 4 mm. wire. Cable winch, fitted with 10-way slip-ring assembly, holds 550 m. of 15/32" cable.

## **ACOUSTICAL CHARACTERISTICS**

Ship cannot be made noiseless.

## **LABORATORIES**

One laboratory (40 sq. ft.), with electrical outlets, used for sample processing, preparation of gear, writing up observations, etc.

#### **HABITABILITY**

Built for use in temperate zones only. Carries 300 gal. of fresh water, no distillation.

#### **OTHER FEATURES**

None. No antirolling devices, ship can operate up to wind force 5.

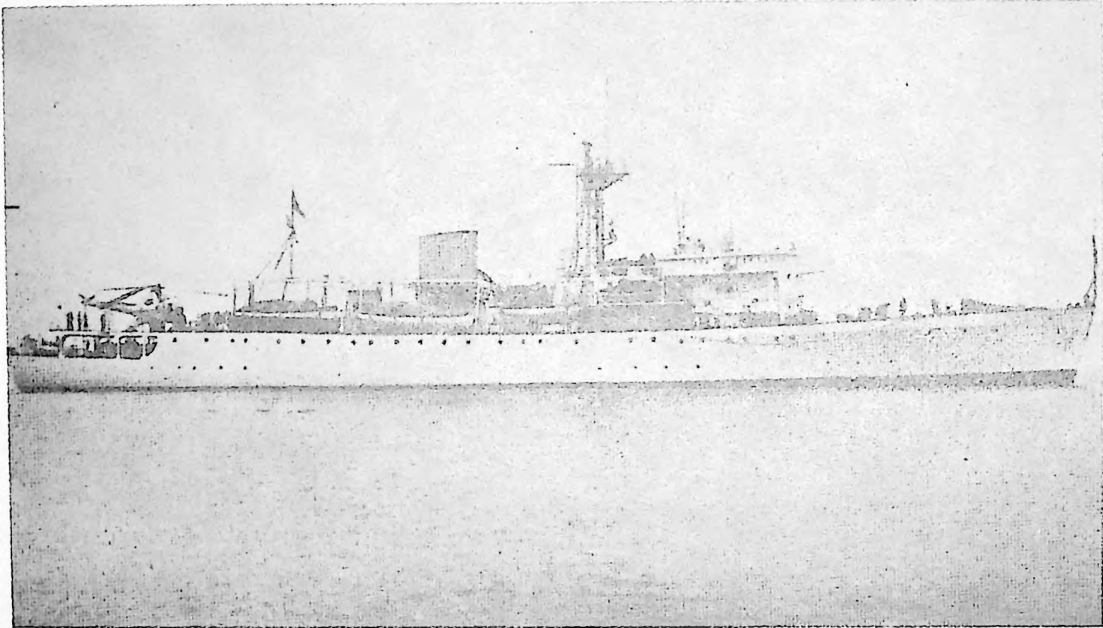
#### **TYPE OF OBSERVATIONS**

Fish population studies, plankton and benthos sampling, hydrographic series (shallow water), current measurements, soundings to 450 fms.

#### **REMARKS**

Women can be carried when ship does not stay out over night. Ship name is Latin for a mollusk.

# VIDAL



**TYPE:** Designed for hydrographic surveying, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1951	315'	40'	13'	2,150 tons (light)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
	15			

## COMPLEMENT

CREW	SCIENTIFIC STAFF
161 (Total)	

## **AFFILIATION**

Hydrographic Department of the Admiralty.

## **PROPULSION**

Four diesel engines driving two shafts through reverse and reduction gear boxes, 8,300 BHP.

## **ELECTRICAL POWER**

Provided from 360 KW, 220V DC diesel generating sets.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Latest electronic aids to surveying and navigation incorporated. Modern communication equipment. Ship has several echosounders and each of three motor launches equipped with echosounding apparatus.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

No information.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Has photographic laboratory which can handle aerial-photographic work, chart reproduction plant, and facilities for other laboratories.

## **HABITABILITY**

Air-conditioning installed to meet equatorial and polar climatic conditions.

## **OTHER FEATURES**

Equipped with helicopter flight deck and hanger, designed to enable a helicopter to land and take off for aerial photography and transport of personnel to shore observation stations. Has three motor launches. Complete deep-sea diving equipment for making underwater observations; professional diver included in ship's crew.

### TYPE OF OBSERVATIONS

Bottom samples, current observations, BT's, and other oceanographic observations.

### REMARKS

Ship primarily a hydrographic-surveying ship but has performed oceanographic work.

# WILLIAM HERDMAN

NO PHOTO AVAILABLE

TYPE: Motor Fishing Vessel.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1945	62'	18'	9'	47 tons		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
	8			7 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
5	5

**AFFILIATION**

University of Liverpool. Used jointly by Marine Biological Station and Oceanography Department.

**PROPULSION**

Diesel engine, single screw, 110 HP.

**ELECTRICAL POWER**

Has 24V DC for ship lighting; 230V AC, 1 KW for scientific use.

**NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Patent log, magnetic compass.

Communication - No information.

Echosounder - Kelvin-Hughes.

**HYDROGRAPHIC WINCHES AND EQUIPMENT**

Trawling winch driven by main engine. Hydrographic winch hand-operated.

**ACOUSTICAL CHARACTERISTICS**

None.

**LABORATORIES**

One general purpose laboratory below deck.

**HABITABILITY**

Restricted to work in Irish Sea and Firth of Clyde.

**OTHER FEATURES**

None.

**TYPE OF OBSERVATIONS**

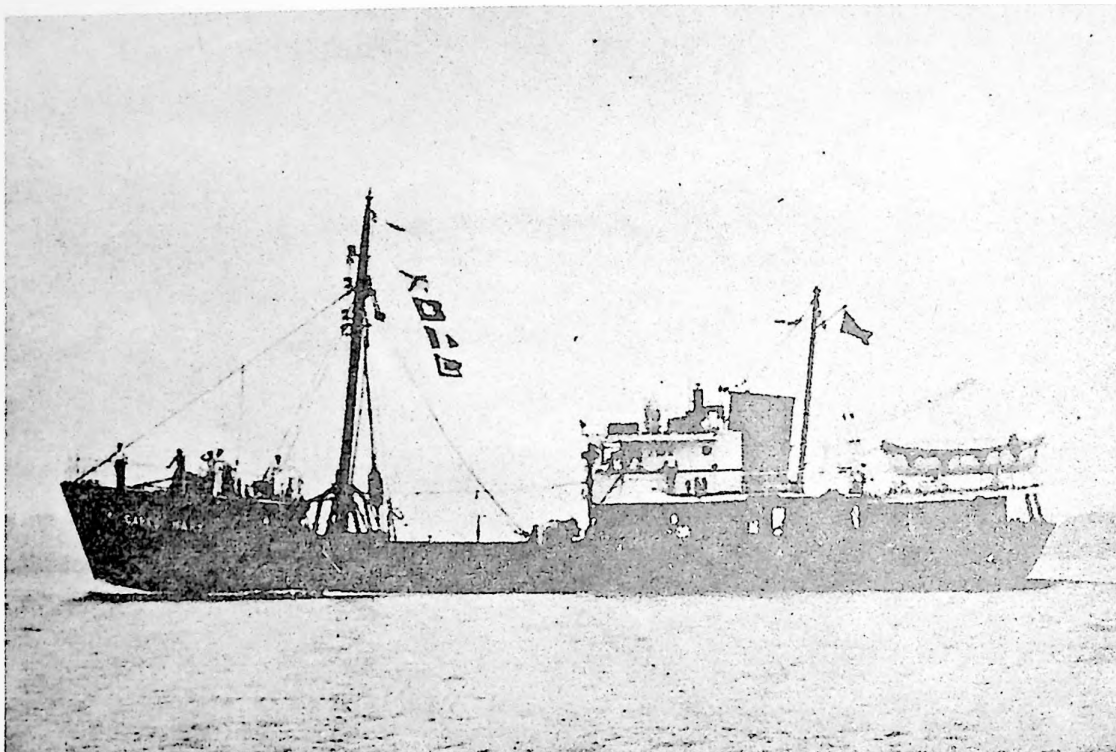
Hydrographic sampling, current measurements, BT, towed electrodes, trawling, dredging, towing nets.



# REMARKS

Named after Professor Sir William Herdman, founder of the Marine Biological Station, Port Erin, and the Oceanography Department, Liverpool.

## CAPE ST. MARY



TYPE: Trawler, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1951	117'	25'	12.5'		239	

### PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
9.4	11		3,000 miles	20 days

### COMPLEMENT

CREW	SCIENTIFIC STAFF
17	3

## **AFFILIATION**

Hong Kong Government, Co-operative Development & Fisheries Department.  
Fisheries Research Station, The Fish Market, Island Road, Aberdeen,  
Hong Kong.

## **PROPULSION**

R.A. Aumt (National) diesel 385 BHP at 550 r.p.m. with single fixed  
blade propeller. Fuel oil capacity 25.26 tons.

## **ELECTRICAL POWER**

Has auxiliary machinery M4A6 (National) 140 BHP at 850 r.p.m. and M4A6  
(National) 70 HP at 850 r.p.m. Electric current is 220V DC.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Radar

Communication - Marconi/993A Transarctic radio.

Echosounders - Kelvin Hughes MS 23, (to be replaced by Kelvin Hughes  
"CERES" for echo ranging and sounding).

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Elliott & Garrood Ltd/V.d.G./W.H.W. No. 1 hydrographic winch with  
3,000 m. cable. Wall Work Gear Ltd./M.M. No. D664 trawl winch,  
33 HP.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Space available above deck 69 sq. ft.

## **HABITABILITY**

Vessel is comfortable, carries 31.2 tons of fresh water.

## OTHER FEATURES

Shunt freezing equipment, 1,375 cu. ft.

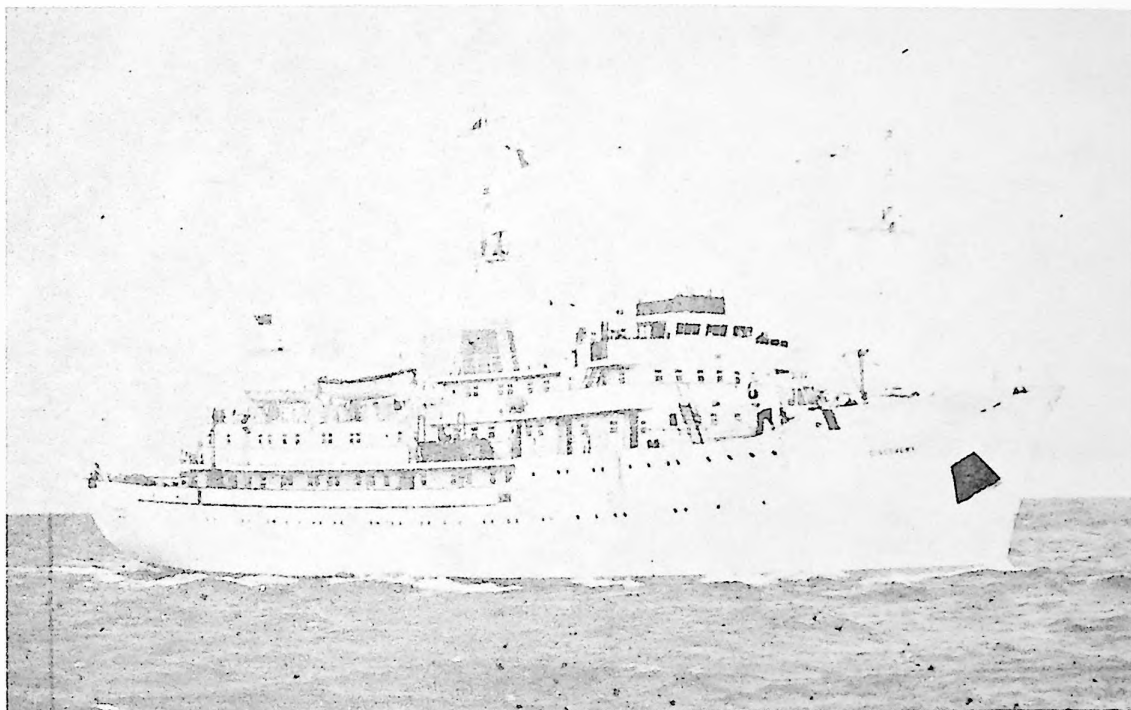
## TYPE OF OBSERVATIONS

Oceanographic and biological observations, exploratory fishing and hydrographic survey.

## REMARKS

Hong Kong Marine Department requires vessel to return to port with not less than 3 tons of fuel remaining as ballast due to unsatisfactory margin of stability. Generally works in South China Sea and Gulf of Tonkin.

# DISCOVERY (NEW) REPLACEMENT OF DISCOVERY II



TYPE: Research Ship, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
Ready by early summer 1962	260'	43'		2,800 tons		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
10			15,000 miles	Extended periods

## COMPLEMENT

CREW	SCIENTIFIC STAFF
40	21

## **AFFILIATION**

National Institute of Oceanography.

## **PROPULSION**

Diesel electric drive with single screw propeller. Fuel storage ample for extended periods at sea.

## **ELECTRICAL POWER**

Adequate reserves of electric power are provided, with maximum output of auxiliary power of 1,200 KW.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigational aids are the most up-to-date types and, in addition to the navigating chart room there is a large survey chart room for use by the scientific staff.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Scientific deck machinery consists of separate trawling and coring winches, a number of small oceanographical winches and a BT winch. In addition, two deck cranes are capable of use at sea.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Has 3,000 sq. ft. of laboratory and auxiliary scientific spaces for marine-physics, biology, chemistry, geophysics and geology. A low temperature laboratory is provided for biological work and a platform on the foremast to house special meteorological instruments.

## **HABITABILITY**

Accommodations generally are at least as good as present day requirements and all living spaces and laboratories are air-conditioned. Fuel and stores are ample for extended periods at sea.

## OTHER FEATURES

Has a bow propeller for providing sideways thrust, an underwater periscope, an open well to lower underwater instruments through the ship forward of fuel tanks. Self-supporting masts and cantilever upper decks. Space provided for a "package" laboratory, in which instruments can be assembled and tested at a shore base and the whole then transferred to the ship and connected to the appropriate services.

## TYPE OF OBSERVATIONS

All purpose research.

## REMARKS

Capable of working in the Arctic, Antarctic, or tropical oceans. This vessel will replace DISCOVERY II (Page 61.7).

# EXPLORER

NO PHOTO AVAILABLE

TYPE: Artic Trawler class.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1955	202'	32'	14' (mean)			

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
	12		8,700 miles	35 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
38 (total)	



## **AFFILIATION**

Fisheries Research Board of Scotland, Marine Laboratory, Aberdeen.

## **PROPULSION**

Triple expansion, oil-fired steam engine, 1,000 IHP, with single screw propeller.

## **ELECTRICAL POWER**

Has sufficient electrical power to perform its mission.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass, radar, direction finder.

Communication - Radio

Echosounders - Has several echosounders.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Powerful trawl winch and three winches for various research projects.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Has three large and well equipped laboratories and two insulated fish rooms.

## **HABITABILITY**

Quarters comfortable for extended voyages.

## **OTHER FEATURES**

Vessel has an icing room and a quick freezing room. Hull specially thickened for work in ice. Bridge deckhouse and the sailing and motor lifeboats are made entirely of aluminum.

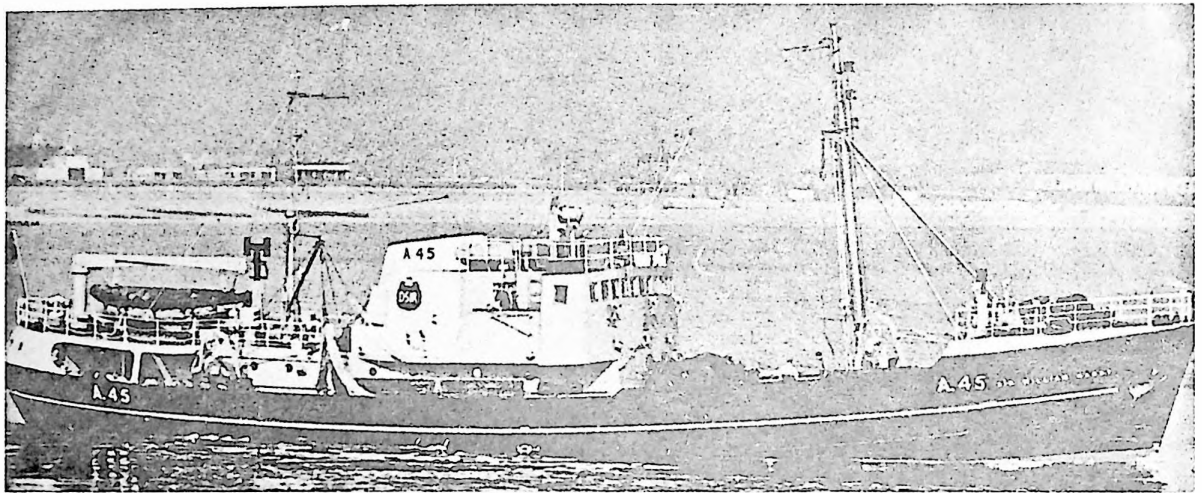
## TYPE OF OBSERVATIONS

Fisheries research and oceanography.

## REMARKS

Vessel was planned to be adaptable not only to Scotland's present research requirements, but also for future use as Scottish fishing vessels penetrate further into North and West Atlantic Ocean.

# SIR WILLIAM HARDY



**TYPE:** Steel hulled, Fishery Research Trawler.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1955	145.6'	27.5'	15'		417.4	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
10.3	11.5		7,000 to 10,000 miles	up to 18 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
16	4

## **AFFILIATION**

Department of Scientific and Industrial Research, Torry Research Station, Aberdeen, Scotland.

## **PROPULSION**

Bridge-controlled, infinitely variable diesel-electric unit driving a fixed pitch propeller. Four Henry Meadows 6-cylinder engines developing 200 BHP each supply power for the Metropolitan Vickers diesel electric units. Fuel capacity 85.65 tons.

## **ELECTRICAL POWER**

Has 220V DC for ships services, 400V AC 3 phase and 230V AC single phase for research. Has variable voltage constant current DC, 500 amps.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Mark V Decca navigator, 200 KW and Marconi Mark IVA radar, 40 KW.

Communication - Marconi "Oceanspan," 1.9 KW.

Echosounders - Marconi Seagraph Mark I and II, range 3,600 ft.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One 150 HP C.D. Holmes/Metrovick constant current trawl winch with 3,900 ft. of cable. Driven by propulsion unit.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Space above deck 110 sq. ft., open deck space 508 sq. ft.

## **HABITABILITY**

For North Sea operations. Has 65 sq. ft. for chief scientist and 91 sq. ft. for other scientists. No evaporator, but has 27.7 ton fresh water tank capacity, and 2 1/2 ton provision capacity.

### OTHER FEATURES

Live fish tank and 7 ton sea water capacity for fish tanks on shore.  
Torry-Hall vertical plate freezers and cold store at  $-30^{\circ}$  centigrade.

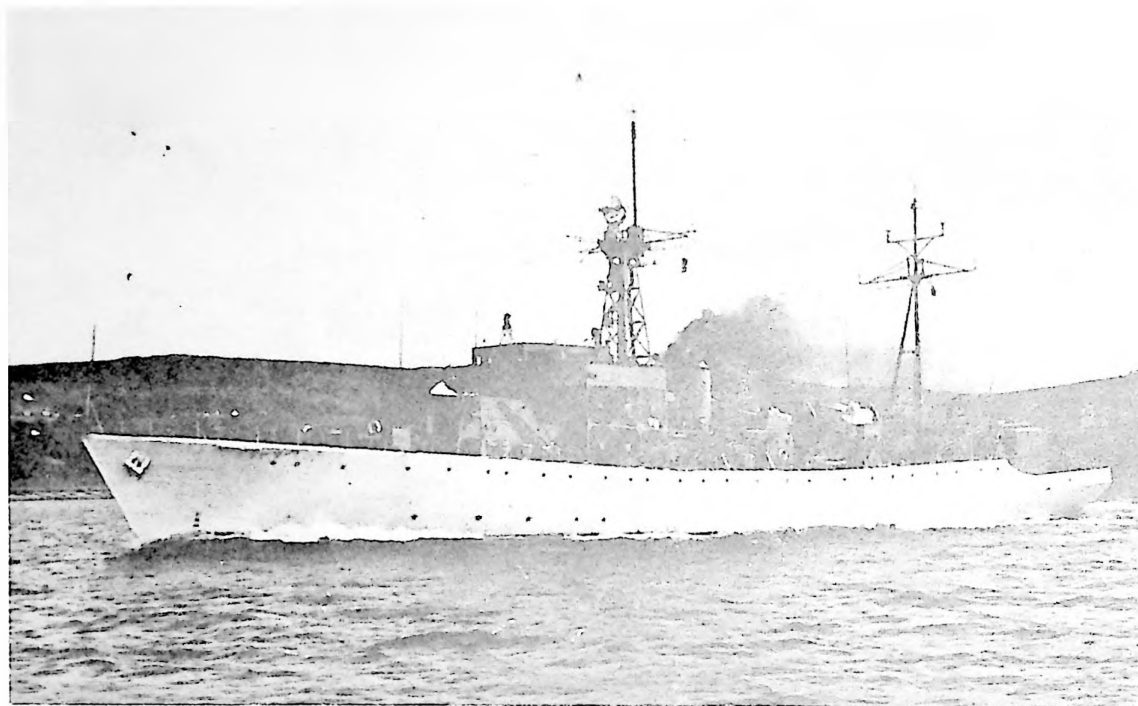
### TYPE OF OBSERVATIONS

Primarily used to observe the handling and processing of fish. Occasional experimental fishing to improve gear efficiency; bottom sampling.

### REMARKS

Heavy roll, but takes little water. Speed considerably affect in head-wind because of large frontal area of bridge. Generally works in the North Sea and northeastern Atlantic.

**WEATHER REPORTER    WEATHER MONITOR**  
**WEATHER ADVISER    WEATHER SURVEYOR**



**TYPE:** Converted "Castle" Class Frigates, steel hull.  
O.W.S. WEATHER REPORTER shown above.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1943	252'	37'	14 1/2'	1,800 tons	1,405	

**PERFORMANCE**

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
10.5	15		6,500 miles	28-34 days

**COMPLEMENT**

CREW	SCIENTIFIC STAFF
60	7

## **AFFILIATION**

Operated jointly by the British Meteorological Office and the Air Ministry.

## **PROPULSION**

Four-cylinder, triple expansion, inverted cylinder, direct reversing, surface condensing steam engine with four cranks, 2,750 IHP at 180 r.p.m. Single fixed pitch propeller. Carries 480 tons of fuel oil.

## **ELECTRICAL POWER**

Diesel generator 15 KW., Electric current 220V DC, 24V DC, 230V AC and 180V AC.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Radar 277Q, range 75 mi.

Communication - Radio.

Echosounders - Has echosounding equipment.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

BT winch electric or hand with 1,800 ft. of cable. Deep sea hydrographic winches are installed or being installed.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Has a well equipped meteorological office and additional facilities could be made available for other laboratories.

## **HABITABILITY**

Carries 127 tons fresh water. Evaporator capacity 24 tons/day.

## OTHER FEATURES

None

## TYPE OF OBSERVATIONS

Mainly meteorological observations, but also BT, and plankton hauls. Underway plankton recorders are towed between station and home port (Greenock, Scotland). Wave spectrum measurements recorded on a Tucker hull mounted wave gauge. Solar radiation measurements with a pyrhelometer

## REMARKS

These vessels were extensively overhauled and phased into service since 1959 replacing the four older "Flower" Class Corvettes. All are considered sea kindly.

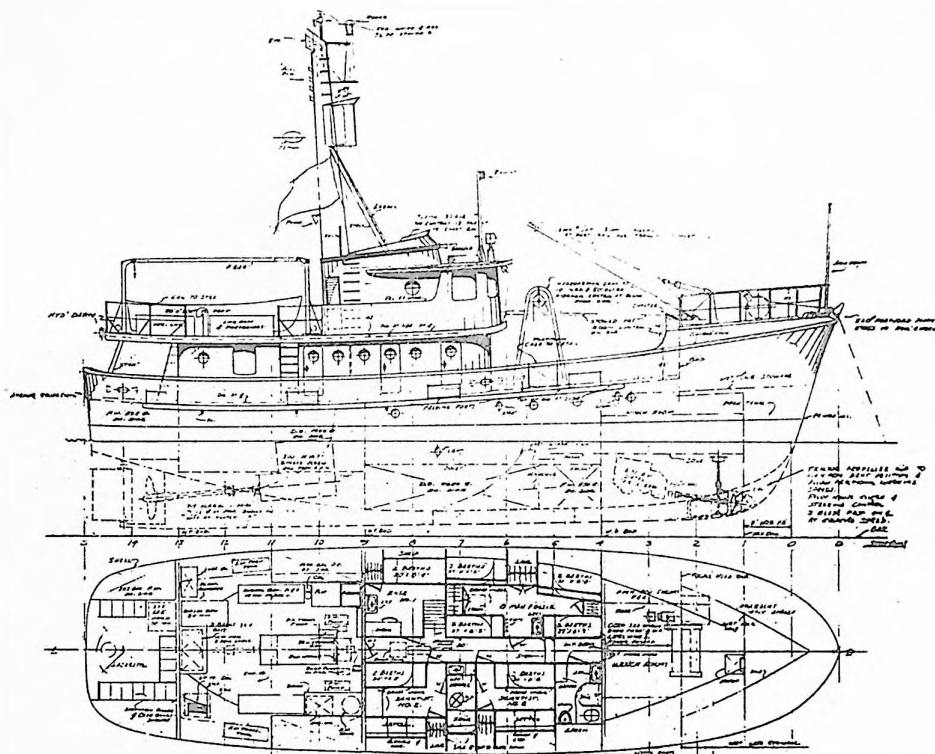




**UNITED STATES OF AMERICA**

**SECTION 62**

# ACONA



**TYPE:** Trawler, built specifically for oceanographic research.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1961	80'	21'8"	9'3"			

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
10			4250 at 10-1/2 kts 5600 at 10 kts.	

## COMPLEMENT

CREW	SCIENTIFIC STAFF
Total	14

## **AFFILIATION**

Department of Oceanography, School of Science, Oregon State College.

## **PROPULSION**

Main engine diesel powered 300 HP Caterpillar D-353, with single fixed-blade propeller. Also has auxiliary propeller forward. Fuel oil capacity 8,500 gal.

## **ELECTRICAL POWER**

Ship has 32V DC electrical system for lighting, main engine starting, and power for certain navigational equipment. A 30 amp. converter for battery charging and other use employing shore 110V AC power. Two 15 KW and one 30 KW diesel generating units power 110/120V AC system for cooking, heating, and 110V equipment operation.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Equipped with Sperry automatic pilot, Sperry loran, Apelco direction finder, Sperry gyrocompass, Northwest Apelco radiophone, Decca radar and EDO.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Hydrographic winch with 6,000' of 3/16" wire rope. Three-ton capacity crane. All winches, davits, and cranes hydraulic powered.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Equipped with wet and dry laboratories, chart room, and library-office.

## **HABITABILITY**

Fresh water tank capacity 2,550 gal. No additional information.

#### OTHER FEATURES

To aid in maneuvering at low speeds and on stations a bow propeller driven by a 140 HP. Caterpillar auxiliary engine is available.

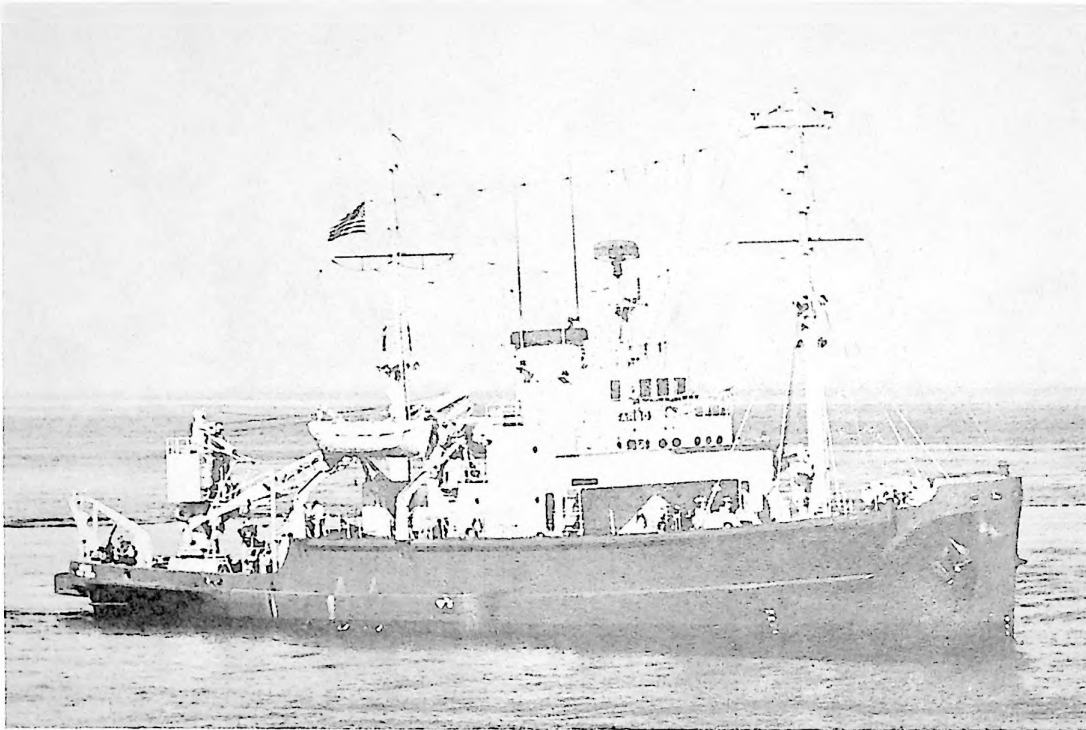
#### TYPE OF OBSERVATIONS

Oceanographic observations.

#### REMARKS

None.

# ARGO



**TYPE:** T-ARS 27, steel hulled, former U. S. Navy Salvage Vessel (SNATCH).

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1944	213'	39-1/2'	15'1"*(full)	2079 tons (full)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
11	14	1	7,000 miles	60 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
40	28

\* Sonar dome projects 5' below base line and ship requires minimum of 24' of water to enter.

## **AFFILIATION**

Operated by Scripps Institution of Oceanography, University of California.

## **PROPULSION**

Four main diesel-electric engines supplying 3800 HP, two fixed-blade screws. Fuel capacity 92,000 gal. Uses Type 2-D Mobil fuel diesel or equivalent (specification 56-C-81).

## **ELECTRICAL POWER**

Ship generates 540 KW. Normal operation requires 80 KW. Available for scientific apparatus, 120 KW AC and 340 KW DC. Characteristics with converters: 440V AC, 60-cycle, 3-phase, 120 KW (two 60 KW diesel generators), and 115V AC, 60-cycle, single phase, 25 KW. Also 115V DC, 320 KW.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass with repeaters, magnetic compass, electromagnetic log for speed and distance, radar (SU-1 and SPS-5), sonar, radio direction finder, loran (2-MK Mod. 2A).

Communication - Receivers: one each RBA, RBB, and two RBC's. Transmitters: TDF(2-9 MC) voice and CW 150W, ART-13 (2-18 MC) voice and CW 50W, TBL-7 (.2-.6 MC and .2-18 MC) voice and CW 250W, TBM (2-18 MC) voice and CW 100W; Lifeboat transmitter; distress frequencies, Auto CW 50W.

Echosounders - SQS-4 Sonar; NMC Echosounder (0-100 fms., 0-200 fms., and 0-4,000 fms.) sometimes used for underwater pings on Nansen bottle trippings. EDO (0-100 ft. and 0-100 fms.) on oscilloscope. On chart 0-600 ft., 0-600 fms. and 0-6,000 fms. Double ranges 600 ft.-1,200 ft. and from 600 fms. to 1,200 fms. A PDR works in conjunction with the EDO to determine extremely accurate depths to 4,000 fms. In utility boat additional EDO and PDR.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Two hydrographic winches (Markey Mech. Co.) with drum capacity of 30,000' of 3/16" wire rope or electric cable. Used for light coring, photography, Nansen casts and 1-meter net tows. Near port side winch is special davit for towing EDO transducer. Two BT winches, drum capacity 1,500' of 3/32" wire or 1,200' of 1/8" wire, with specially designed level wind. Dredge winch (hydraulic) with 45,000' of 3/4" to 3/8" tapered wire on one reel and 30,000' of 1/2" wire on other

reel. Has several cranes. A hand powered rotating and luffing crane with capacity of 2,000 lbs. at 7' outreach, and kingpost rotating crane with 50' working length boom capable of hoisting 6,000 lbs. at 100 ft./min. This crane may be swung over the "A" Frame for use in heavy material handling over stern.

### ACOUSTICAL CHARACTERISTICS

A thorough acoustical check has not been made, but it appears that the noise level with the auxiliaries running is practically nil on seismic work. Battery power not available for quiet ship.

### LABORATORIES

Main deck laboratory (1,600 sq. ft.), one part used as a geophysical laboratory and the other for hydrographic, chemical, and geological work. Flying bridge laboratory (296 sq.ft.), used for geophysical and other observations which require all around visibility. A laboratory office adjoins the main deck laboratory. Facilities for handling any laboratory requirements are available in these laboratories.

### HABITABILITY

Laboratories and other specially selected spaces air-conditioned. Ship heated. Ship capable of operating in all navigable waters. Fresh water tank capacity 47,000 gal. No distillation apparatus but supply is considered sufficient for daily bathing by all. No salt water showers. Women scientists may be accommodated.

### OTHER FEATURES

Ship has icebreaker bow, portable 275 cu.ft. freezer for core sample storage. With rolling keels ship may operate in rougher seas at 15% reduced speed for each number of Beaufort scale in excess of 7.

### TYPE OF OBSERVATIONS

All types of oceanographic work performed, except upper air meteorological research.

### REMARKS

Largest of the University of California's research fleet. Named after the mythological ship, Argo, in which Jason sailed in search of the Golden Fleece. Converted to research vessel 1959-1960 to give the best possible living and working accommodations. Carries a 32' utility boat capable of independent shallow water oceanographic work.

# ATKA



**TYPE:** AGB-3, Icebreaker, steel hulled.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1944	269'	63'	29' (aft)	6500 tons (full load)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
14	16	2	11,000 miles	120 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
234	up to 20



## **AFFILIATION**

U. S. Navy.

## **PROPULSION**

Diesel-electric direct drive propulsion plant, made up of six diesel engines capable of producing 5,000 HP for each of her twin fixed-blade screws. Fuel tank capacity is 2,650 cu. m.

## **ELECTRICAL POWER**

Ship generates 1,250 KW. Adequate AC available.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass, magnetic compass, sea search radar, loran, ship log.

Communication - Standard U. S. Navy transmitters and receivers.

Echosounders - Navy UQN-1C with variable ping length.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One BT winch with 3,000' of 3/32" wire. One Wheeler or Lakeshore winch with 20,000' of 5/32" wire.

## **ACOUSTICAL CHARACTERISTICS**

Quiet ship services not available.

## **LABORATORIES**

Wet laboratory with electrical, fresh and salt water taps. Aerology Laboratory.

## **HABITABILITY**

Tropical work not advisable. Salt water showers not normally utilized. Fresh water capacity 215 tons. Distillation 38 tons/day. Can carry dry provisions for over 300 days of steaming, and frozen meats and foods for over 200 days at sea.

### **OTHER FEATURES**

Can break ice up to 20' thick. Equipped with two helicopters. Has two LCVP's on board. Has antirolling-roll tanks. Can perform scientific investigations in seas up to Sea State 3.

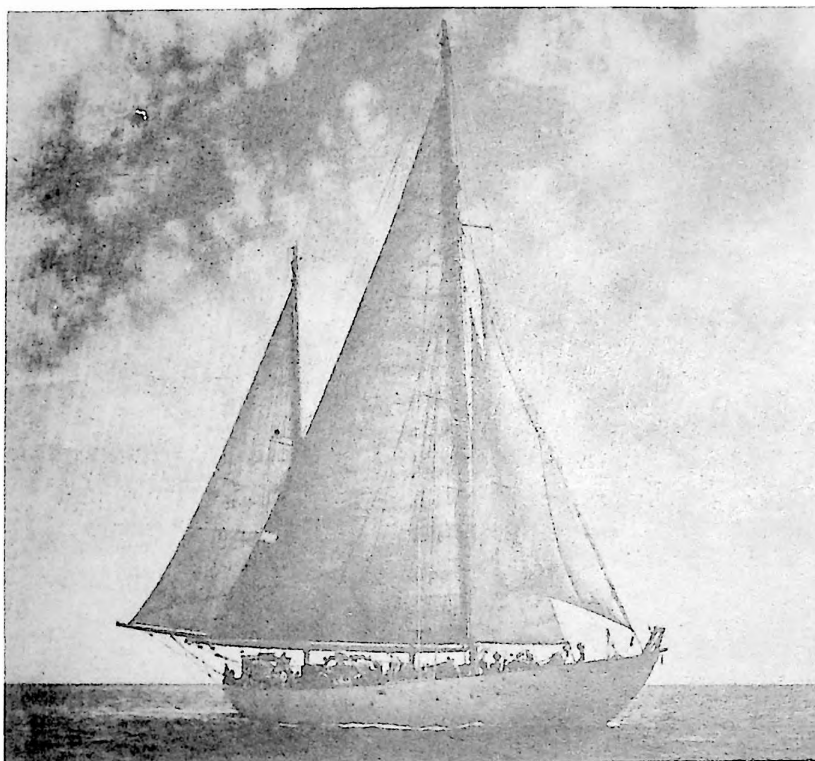
### **TYPE OF OBSERVATIONS**

Hydrographic casts, light coring and dredging, plankton tows, BT's and continuous temperature recordings. Primary mission icebreaking but generally always has scientific complement on board.

### **REMARKS**

Open sea operations not advisable.

# ATLANTIS



**TYPE:** Riveted steel Ketch with auxiliary diesel power, designed for oceanographic research by Owens and Minot, Boston.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1931	143-1/2'	28'	18-1/2'	565 long tons (full load) 450 long tons (light)	295	35

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
9 (power)	12 (sail) 10 (power)	0 (w/sail) 4 (w/power)	variable with sails	30 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
17	9

## **AFFILIATION**

Owned and operated by Woods Hole Oceanographic Institution.

## **PROPULSION**

Direct reversing diesel, single solid wheel propeller, 400 HP. Sails available. Diesel oil No. 2 required.

## **ELECTRICAL POWER**

Ship has two 60 KW 110V DC diesel generators and one battery bank of 40W-hrs. Normal ship operations require 30 KW. Two converters, can convert 4 KW 110V DC to 120V AC single phase, 60-cycle. Battery gives 4 KW for 10 hrs.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass and repeaters, magnetic compass, pit log, radar, radio direction finder, loran.

Communication -TCP 75W medium frequency transceiver (voice and CW). Standard commercial (RCA) medium and high frequency transmitters and receivers. Emergency lifeboat transceiver.

Echosounders - One precision ground recorder, Alder Recorder, EDO UQN-1 transmitter and transducer with variable ping length. Maximum precision based on resolution of trace to one part in 6,000. Has fathometer for piloting in water shallower than 400 ft.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One BT winch (mfg. WHOI) with 2,000' of 3/32" wire. One hydrographic winch (mfg. Lidgerwood) with 30,000' of 3/16" wire. One coring winch (mfg. Lidgerwood) with 25,000' of 1/2" wire.

## **ACOUSTICAL CHARACTERISTICS**

Battery power available for quiet ship work. On battery power and under sail, radiated and internal noise levels low enough for seismic work at sea.

## **LABORATORIES**

Two laboratories. Main laboratory, multipurpose, has 110V AC, 110V DC and salt water tap. Lower laboratory, multipurpose, has same facilities.

### **HABITABILITY**

Not well-suited for tropics or frigid latitudes, no air conditioning, working deck is fully exposed to ice and water. Carries 26 tons of fresh water, no evaporator.

### **OTHER FEATURES**

Sails and deep keel act as antirolling devices.

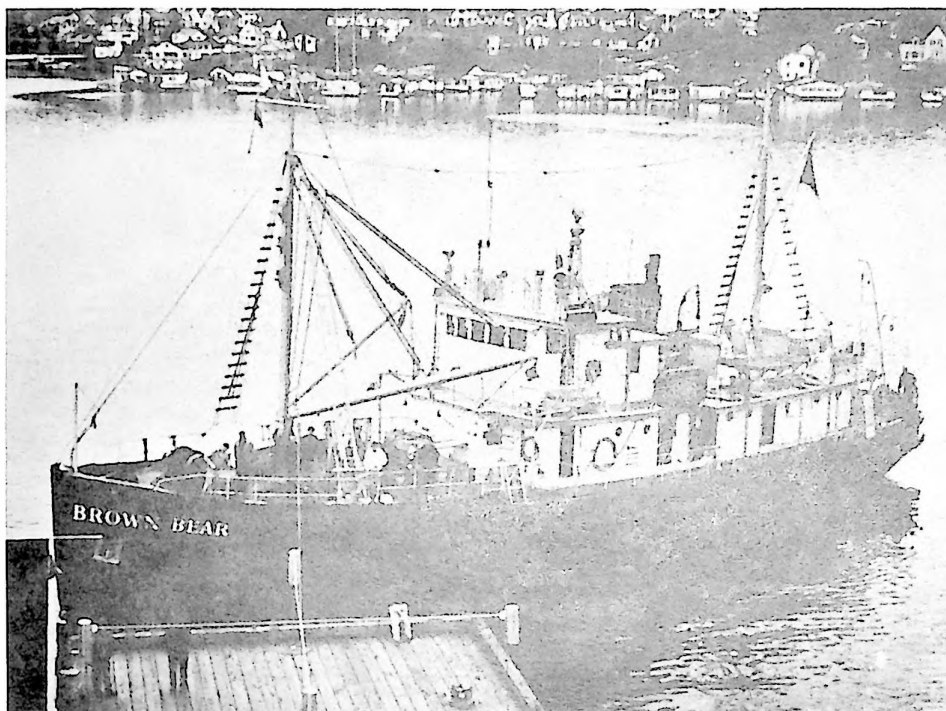
### **TYPE OF OBSERVATIONS**

Can perform all types of oceanographic work at sea including hydrographic, dredging, coring, biological, chemical, physical, acoustical.

### **REMARKS**

Due to small size and small complement, generally limited to single-purpose cruises. Cost of operation \$1,000/day.

## BROWN BEAR



**TYPE:** Wooden hulled, Coastal Freighter formerly owned by U. S. Fish and Wildlife Service.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1934	116'	27'	13'	-	300	-

### PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
8-1/2	9	1/2	5400 miles (steaming)	26 days

### COMPLEMENT

CREW	SCIENTIFIC STAFF
11	19

## **AFFILIATION**

Owned and operated by Department of Oceanography, University of Washington.

## **PROPULSION**

Two diesel engines with two fixed-pitch propellers, 400 HP. Carries 13,000 gal. of fuel.

## **ELECTRICAL POWER**

Ship generates 60 KW DC and 20 KW AC. Required for ship operations- 30 KW DC, and 2 KW AC. Available for scientific equipment - 30 KW DC and 18 KW AC. With converters, 110V DC, 60 KW and 110V AC, 60-cycle, 20 KW available.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass, magnetic compass, radar, ADF, loran.

Communication - Radios - output 100W, 30W, and 5 W.

Echosounders - EDO model UWN-1 sounder, EDO model 255-C-24 portable sounder, Ross Mod. 240 depth indicator, Ross Mod. 80 portable depth indicator.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Main winch (electric) has 1,100 m. of 5/8" wire on one drum and 6,500 m. of tapering 1/4" to 5/8" wire on other drum. Hydraulic winch with 2,200 m. of 5/32" wire. BT winch with 600 m. of 1/8" wire.

## **ACOUSTICAL CHARACTERISTICS**

Vessel not equipped for noise elimination.

## **LABORATORIES**

Main laboratory (420 sq. ft) for sample analysis. Deck laboratory (100 sq. ft) for gathering samples.

### **HABITABILITY**

Built to work in temperate and sub-Arctic regions. Fresh water capacity 6,000 gal. No salt water showers or distillation apparatus.

### **OTHER FEATURES**

With rolling keels can operate up to Sea State 6.

### **TYPE OF OBSERVATIONS**

Hydrographic casts, bottom sampling, coring, dredging, biological hauls, continuous recording surface temperature and salinity, continuous recording radiation, BT, currents, bathymetry.

### **REMARKS**

Well suited for training students in oceanography and fjord oceanography.



# BURTON ISLAND

NO PHOTO AVAILABLE

**TYPE:** AGB-1, Icebreaker, steel hulled.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1946	269'	63'	29' (aft)	6500 tons (full load)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
14	16	2	11,000 miles	120 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
234	up to 20

## **AFFILIATION**

U. S. Navy.

## **PROPULSION**

Diesel-electric direct drive propulsion plant, made up of six diesel engines capable of producing 5,000 HP to each of her twin screws. Fuel tank capacity 2,650 cu. m.

## **ELECTRICAL POWER**

Ship generates 1,250 KW. Adequate AC available.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass, magnetic compass, sea search radar, loran, ship log.

Communication - Standard U. S. Navy transmitters and receivers.

Echosounders - Navy UQN-1C, with variable ping length.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One BT winch with 3,000' of 3/32" wire. One Wheeler or Lakeshore winch with 20,000' of 5/32" wire.

## **ACOUSTICAL CHARACTERISTICS**

Quiet ship services not available.

## **LABORATORIES**

Wet laboratory with electrical, fresh, and salt water taps. Aerology laboratory.

## **HABITABILITY**

Tropical work not advisable. Salt water showers not normally utilized. Fresh water capacity 215 tons. Distillation 38 tons/day. Can carry dry provisions for over 300 days of steaming and frozen meats and foods for over 200 days at sea.

### OTHER FEATURES

Can break ice up to 20' thick. Equipped with two helicopters. Has two LCVP's on board. Has antirolling-roll tanks. Can perform scientific investigations in seas up to Sea State 3.

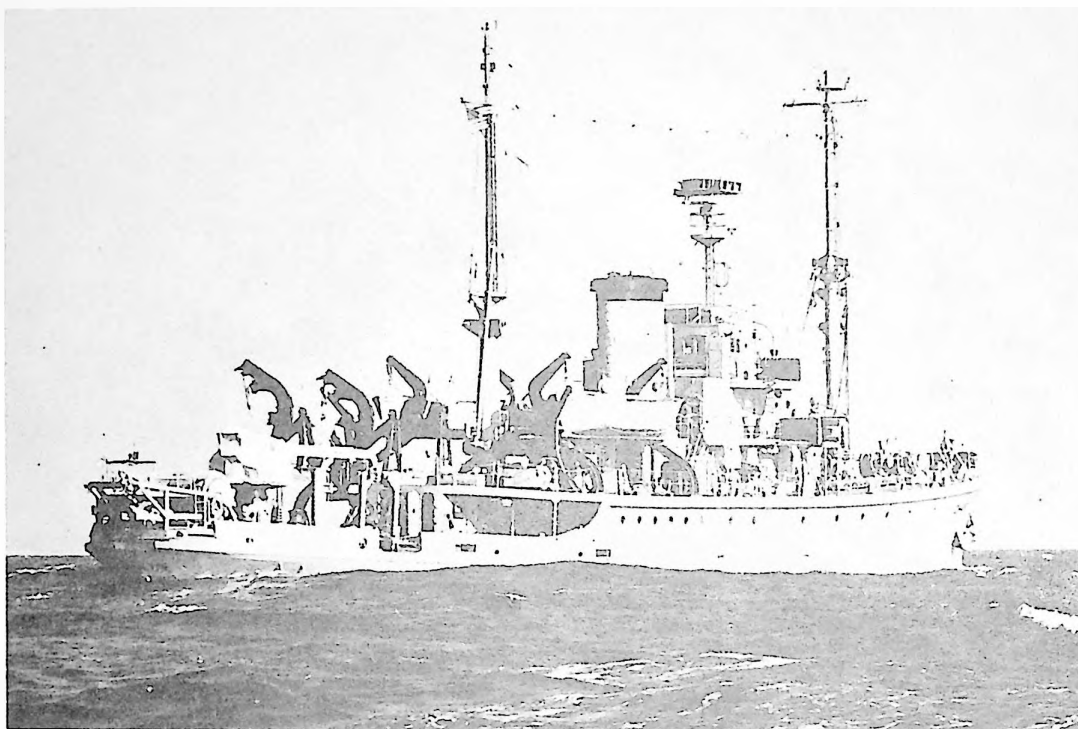
### TYPE OF OBSERVATIONS

Hydrographic casts, light coring and dredging, plankton tows, BT's and continuous temperature recordings. Primary mission ice breaking, but generally always has scientific complement on board.

### REMARKS

Open sea operations not advisable.

## CHAIN



**TYPE:** T-ARS 20, steel hulled, former U. S. Navy Deep-Sea Salvage Vessel.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1943	214'	41-1/4'	15.5'	2,100 long tons	1600	1200

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
12.5	14	5 (less with outboard)	6,000 miles	60 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
29	26

## **AFFILIATION**

Operated by MSTTS, under the technical control of Woods Hole Oceanographic Institution.

## **PROPULSION**

Four main diesel-electric engines supplying 3,000 HP. In addition to two main propellers, an auxiliary Murray and Tregurtha 250 HP outboard propulsion unit available for maneuvering at low speeds (up to 4-1/2 knots). Fuel oil capacity 92,000 gal. (No. 2 grade diesel oil). Butane available for cooking when ship on batteries.

## **ELECTRICAL POWER**

Ship has two 200 KW, one 60 KW, and one 40 KW, 100V DC diesel generators. Normal ship operation requires 80 KW; 420 KW available for scientific research plus 10 KW for 20 hrs. from batteries. Also 2,000 KW could be available from main propulsion generators at 230 to 550V DC. Converters: 10 KW, 120V AC, 3-phase, 60-cycle; 30 KW, 440V AC, 3-phase, 60-cycle; 75 KW, 440V AC, 3-phase, 60-cycle; 5 KW, 440V AC, 3-phase, 60-cycle; 10 KW, 440V AC, 3-phase, 60-cycle; 80 KW, 230V DC, 3-phase, 60-cycle.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass- Sperry Mark XIV; magnetic compass; ship log (Pit log); ship radar with repeater; Sperry Mark III; radio direction finder (Macay low freq.); loran A; Decca; inertial system.

Communication - Three standard merchant transmitters and receivers consisting of 250W CW medium frequency, 250W CW and voice high frequency, 250W CW and voice high frequency, and 100W CW emergency frequency. One Science 200W medium frequency Apelco transceiver. One emergency lifeboat transceiver.

Echosounders - Two precision ground recorders, Alden recorders, EDO UQN-1 Transmitters and Transducers with variable ping length. Maximum precision based on resolution on trace to one part in 6,000. Also fitted with fathometer for piloting use in less than 400 ft.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

A deep-sea coring and towing winch capable of reaching depths of 30,000' and performing coring operations involving loads as heavy as 10 tons. Hydraulically operated coring frame mounted on the side of the ship also used in this work. In addition, on starboard deck, hydrographic winch, bathythermograph winch, acoustic winch, and "A" Frame. On after-deck two cargo winches, two 3-ton booms and two 1-ton booms. Two more cargo winches located on the foredeck.

## ACOUSTICAL CHARACTERISTICS

Facilities for silent ship operations (battery bank, 10 KW for 20 hrs., and 40 KW diesel generator). National Bureau of Standards sound velocimeter lowered at drifting stations for hydrographic or sound transmission studies. Detailed sound velocity profiles constructed from frequency counter log paper tapes. Other acoustic equipment available on board: AC-58 Rochelle salt hydrophones, BC-30 barium titanate hydrophones, WHOI "suitcase" amplifiers and Allison variable filters run driver amplifier for pen galvanometer and tape recorders.

## LABORATORIES

Four main laboratories - electronics laboratory, chemistry laboratory, wet laboratory, and bridge laboratory or scientific operation center. In addition, conference room or scientists' lounge, darkroom, machine shop, and laboratory storerooms.

## HABITABILITY

Not well suited for prolonged work in tropics nor in extreme cold; no air-conditioning, ventilation poor. Fresh water capacity 70 long tons. Distillation capacity 15 long tons/day, consumption about 7 long tons/day. No limits placed on fresh water consumption.

## OTHER FEATURES

Has 18" diameter tube from main deck thru bottom of ship, not used often. Sound pulse source (pinger) routinely attached to devices being lowered on cables. Direct ping and bottom echo can be monitored on graphic recorder in laboratory, and distance of source from bottom determined. Underwater cameras can be accurately positioned above bottom, and action of coring devices monitored. Has bilge keels; seakeeping ability rated good.

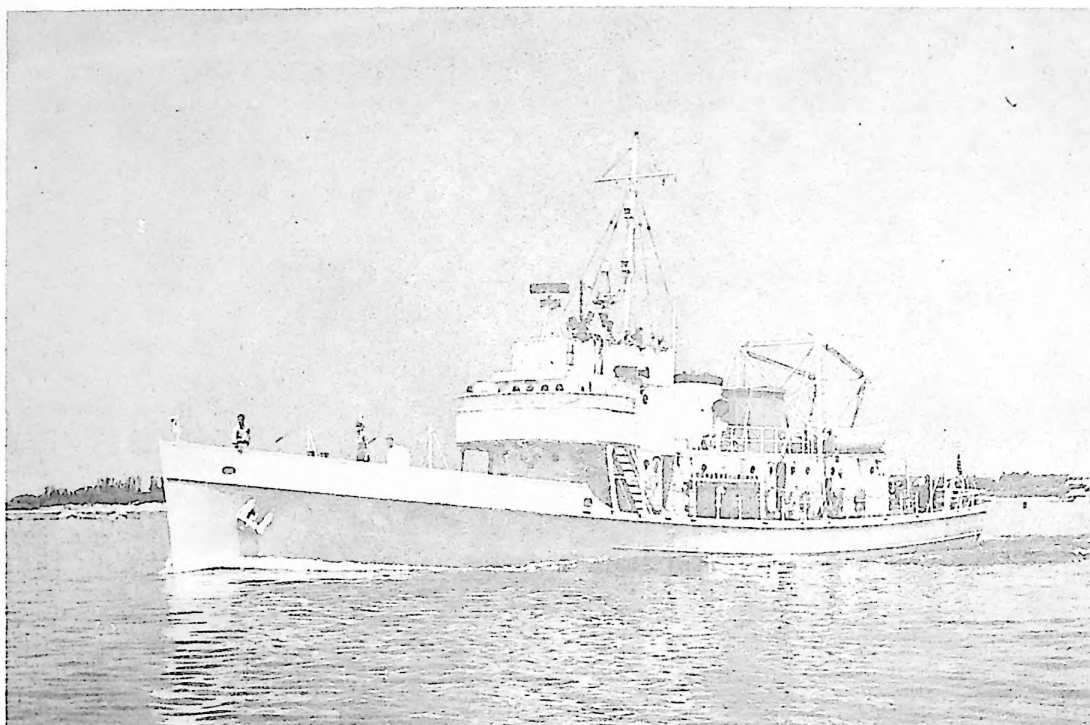
## TYPE OF OBSERVATIONS

Well-fitted and large enough to make practically all types of oceanographic observations, including: hydrographic, bottom sampling, coring, dredging, biological, seismic, etc. Equipment for gravity measurements being fitted.

## REMARKS

Ship converted for oceanographic research in 1958. Name derived from use of chain in salvage work. One of more versatile of U. S. oceanographic fleet, in that it is capable of doing physical, geological, and biological investigations. Facilities for women scientists. Cost of operation about \$2,000/day.

# CRAWFORD



**TYPE:** Former U. S. Coast Guard Cutter converted by WHOI for oceanographic research in 1956; hull riveted steel construction with wooden decks.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1927	125'	24'	10.2' (aft)	322 long tons (full)	260	190

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
11	12	4	5,000 miles at 8 kts.	30 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
15	8

## **AFFILIATION**

Owned and operated by Woods Hole Oceanographic Institution.

## **PROPULSION**

General Motors 6-268 diesel engines with reverse-reduction gears. Two propellers, solid wheels; 800 HP. Uses diesel oil No. 2.

## **ELECTRICAL POWER**

Ship has two 60 KW, 120V DC diesel generators. Normal operation requires 40 KW. Converters: two 2.5 KVA, 60-cycle, 110V AC and two 4.5 KVA, 60-cycle, 110V AC. Batteries supply 4 KW 110V DC for 10 hrs.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass and repeaters, magnetic compasses, radar, radio direction finder, and loran.

Communication - TCP 75W medium frequency (voice and CW). Standard commercial (RCA) medium and high frequency transmitters and receivers. Emergency lifeboat transceiver.

Echosounders - One precision ground recorder, Alden Recorder, EDO UQN-1 transmitter and transducer with variable ping length. Maximum precision based on resolution of trace to one part in 6,000. Has a piloting fathometer for use in less than 400 ft.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One BT winch (WHOI mfg.) with 2,000' of 3/32" wire. One hydrographic winch (WHOI mfg.) with 30,000' of 3/16" wire.

## **ACOUSTICAL CHARACTERISTICS**

Internal levels underway are poor due to engine noise. Ship can be put on quiet condition with battery bank (4 KW for 10 hrs.), galley operates on butane gas so that quiet ship condition does not prohibit cooking.

## **LABORATORIES**

Main laboratory has 110V AC, 110V DC, butane, compressed air, hot and cold fresh water, and cold salt water.



### **HABITABILITY**

Completely air-conditioned, well suited for tropical work. Not suitable for work in frigid zones. Fresh water capacity 1,800 gal. Evaporator output 1,000 gal/day.

### **OTHER FEATURES**

Bilge keels.

### **TYPE OF OBSERVATIONS**

May undertake all observations that do not require the use of dredging or coring winch. Because of small size, only one program comfortably accommodated on a cruise.

### **REMARKS**

Ship operation cost \$1,000/day.

# EASTWIND

NO PHOTO AVAILABLE

**TYPE:** WAGB-279, Icebreaker, steel hulled.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1943	269'	63'	29' (aft)	6,500 tons (full load)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
14	16	2	11,000 miles	120 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
234	up to 20

## **AFFILIATION**

U. S. Coast Guard.

## **PROPULSION**

Diesel-electric direct drive propulsion plant, made up of six diesel engines capable of producing 5,000 HP for each of twin screws. Fuel tank capacity 2,650 cu. m.

## **ELECTRICAL POWER**

Ship generates 1,250 KW. Adequate AC available.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass, magnetic compass, sea search radar, loran, ship log.

Communication - Standard U. S. Navy transmitters and receivers.

Echosounders - Navy UQN-1C with variable ping length.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One BT winch with 3,000' of 3/32" wire. One Wheeler or Lakeshore winch with 20,000' of 5/32" wire.

## **ACOUSTICAL CHARACTERISTICS**

Quiet ship services not available.

## **LABORATORIES**

Wet laboratory with electrical, fresh, and salt water taps. Aerology laboratory.

## **HABITABILITY**

Tropical work not advisable. Salt water showers not normally utilized. Fresh water capacity 215 tons. Distillation 38 tons/day. Can carry dry provisions for over 300 days of steaming and frozen meats and food over 200 days at sea.

### **OTHER FEATURES**

Can break ice up to 20' thick. Equipped with two helicopters. Has two LCVP's on board. Has antirolling-roll tanks. Can perform scientific investigations in seas up to Sea State 3.

### **TYPE OF OBSERVATIONS**

Hydrographic casts, light coring and dredging, plankton tows, BT's and continuous temperature recordings. Primary mission ice breaking, but generally always has scientific complement on board.

### **REMARKS**

Open sea operations not advisable.

# EDISTO

NO PHOTO AVAILABLE

TYPE: AGB-2, Icebreaker, steel hulled.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1947	269'	63'	29' (aft)	6500 tons (full load)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
14	16	2	11,000 miles	120 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
234	up to 20

## **AFFILIATION**

U. S. Navy

## **PROPULSION**

Diesel-electric direct drive propulsion plant, made up of six diesel engines capable of producing 5,000 HP for each of twin screws. Fuel tank capacity 2,650 cu. m.

## **ELECTRICAL POWER**

Ship generates 1,250 KW. Adequate AC available.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass, magnetic compass, sea search radar, loran, ship log.

Communication - Standard U. S. Navy transmitters and receivers.

Echosounders - Navy UQN-1C with variable ping length.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One BT winch with 3,000' of 3/32" wire. One Wheeler or Lakeshore winch with 20,000' of 5/32" wire.

## **ACOUSTICAL CHARACTERISTICS**

Quiet ship services not available.

## **LABORATORIES**

Wet laboratory with electrical, fresh, and salt water taps. Aerology laboratory.

## **HABITABILITY**

Tropical work not advisable. Salt water showers not normally utilized. Fresh water capacity 215 tons. Distillation 38 tons/day. Can carry dry provisions for over 300 days of steaming and frozen meats and foods for over 200 days at sea.

## OTHER FEATURES

Can break ice up to 20' thick. Equipped with two helicopters. Has two LCVP's on board. Has antirolling-roll tanks. Can perform scientific investigations in seas up to Sea State 3.

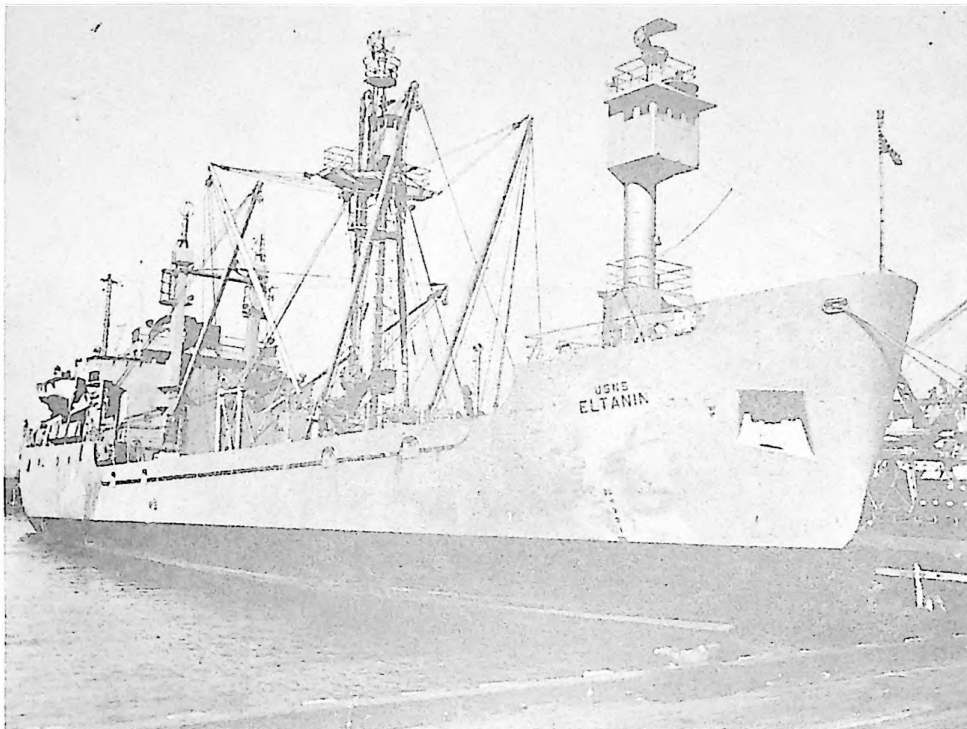
## TYPE OF OBSERVATIONS

Hydrographic casts, light coring and dredging, plankton tows, BT's and continuous temperature recordings. Primary mission ice breaking but generally always has scientific complement on board.

## REMARKS

Open sea operations not advisable.

# ELTANIN



**TYPE:** T-AK 70, Cargo ship, welded steel hull with a raked ice-breaker form bow and a modified cruiser stern.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1957	266' 2"	51'	19-3/4' (full)	3,886 tons (full)	2,486	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
13			10,000 at 12 kts.	

## COMPLEMENT

CREW	SCIENTIFIC STAFF



## **AFFILIATION**

Owned by MSTs and operated by them for the National Science Foundation.

## **PROPULSION**

Diesel electric, driving twin 4-bladed screws, 2,700 SHP.

## **ELECTRICAL POWER**

No information, presumed sufficient to accommodate any research problem.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

No information, presumed to be well equipped.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

No information, presumed to be well equipped.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Planned to convert present hold and tween decks to laboratories, quarters for scientific party, and scientific stores. Enclosed laboratories will be built on the forward part of the main deck extending from the forecastle head to the main mast. Main deck space forward of the bridge superstructure and the main mast will be clear for deep sea trawling and over-side operations.

## **HABITABILITY**

Can operate in all navigable waters. Quarters will be comfortable and fresh water supply will be sufficient for extended cruises. Double hull feature is extended up to the main deck and other cold weather operation characteristics are built in.

## **OTHER FEATURES**

Helicopter deck to be installed aft of the bridge.

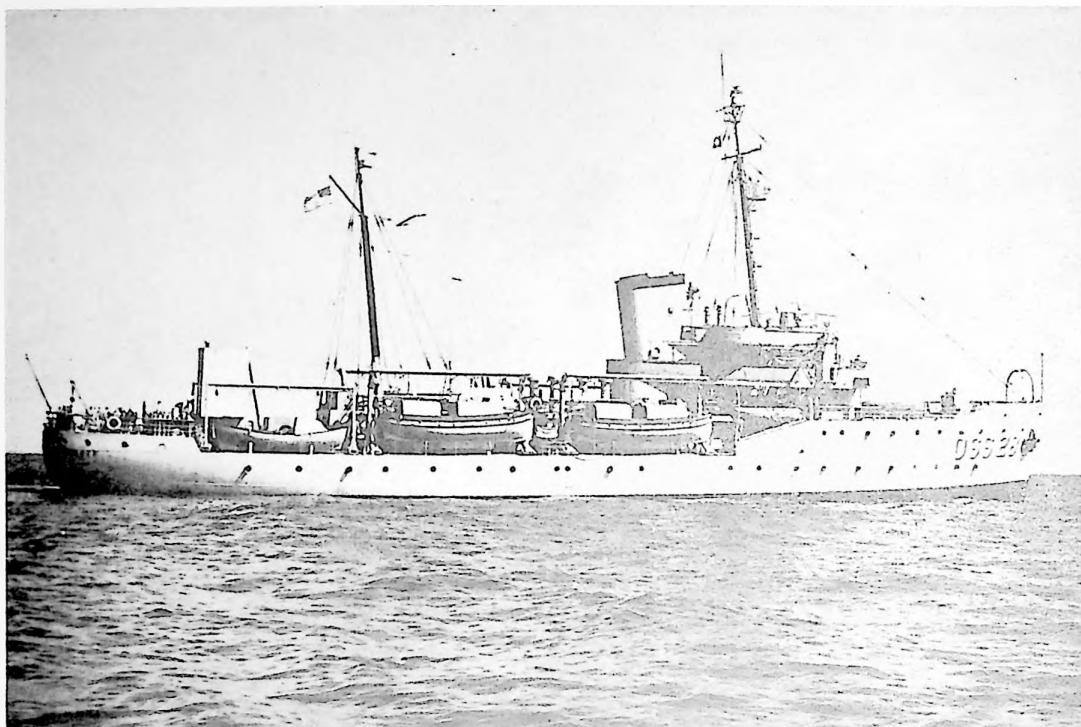
### **TYPE OF OBSERVATIONS**

Will be fitted to accommodate numerous disciplines, including meteorology, upper atmosphere studies, marine and terrestrial biology, physical oceanography, submarine geology and geomagnetic studies.

### **REMARKS**

This ship is presently being converted, and should be operative in late 1961.

## EXPLORER



**TYPE:** Steel hulled; designed and built as a Hydrographic Survey Ship.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1940	219.6'	38.0'	15.0' (mean)	1900 tons (full load)		

### PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
12.5	13.3	3.0	at 12-1/2 kts.3750 miles and 12-1/2 days at 6-1/2 kts.2960 miles and 19 days at 3 kts. 1875 miles and 26 days	

### COMPLEMENT

CREW	SCIENTIFIC STAFF
79	23 (including officers)

## **AFFILIATION**

U. S. Coast and Geodetic Survey.

## **PROPULSION**

Steam-turbine with single fixed blade screw developing 2,000 IHP. Uses Navy special fuel oil. Bunker C fuel oil cannot be used because there are no heating coils in the fuel tanks. Fuel consumption: at 12-1/2 kts, 5,040 gal./day; at 6-1/2 kts, 3,360 gal./day; at 3 kts, 2,400 gal./day. and at anchor or laying to, 1,400 gal./day. These figures assume reasonably good weather and distiller not in operation (distiller consumes 200 gal. of fuel oil per day). Galley store uses 600 gal./month; AC diesel-driven generator uses 100 gal./day at full load; four diesel-driven launches use 2 gal./hr. of high-speed diesel oil. Tank capacity for main turbine lubricating oil is 700 gal. (about two month's supply of 30 SAE turbine oil). Diesel launch engine lubricating oil stored in 5 gal. cans.

## **ELECTRICAL POWER**

Ship generates 150 KW. Approximately 75 KW DC power required for normal operation when all ventilating fans on full speed. Various blowers and ship's large service air compressor must be secured to operate the 25 HP winch. Thirty KW DC available for scientific apparatus, also 30 KW AC 60-cycle, single-phase. No direct current available by use of batteries.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Raydist, shoran, loran, gyrocompass, magnetic compass, ship log, radar.

Communication - Northern Radio Transreceiver, crystal controlled AM and CW, frequency 2,000 to 6,000 KC. Has 100W voice and CW, 115V DC only.

RCA Radio Telegraph transmitters, crystal controlled and master oscillator 500 KC, CW and 4,000 to 13,500 KC, CW only. Has 115V DC and emergency batteries. TCS transceiver crystal and master oscillator controlled, frequency 1.5 MC to 12 MC, CW and voice transmission, 10W voice and 25W CW. AM and CW, 115V AC and 12V DC batteries.

Motorola FM Transceiver, crystal controlled, FM only, frequency 30.0 MC to 50 MC, voice operation only, 115V AC only. RF RCA receiver, from 400 KC to 600 KC, CW and AM, 115 AC or batteries. NC 400 National radio receiver, CW, SSB, AM, ANL, frequency from 154 MC to 31 MC 115V AC only. Hammerland SUPER-PRO SP-400 AM and CW operation frequency 154 to 30.0 MC, 115V AC only.

Echosounders - Four shoal water Submarine Signal Company Type 808. Has two sounding scales, ft. and fms. Four scale ranges of 55 ft. or fms. each. Twenty ft. or fms. overlap between scales. Trace resolution of graph plus or minus 0.1 ft. or fms. Stylus speed governor controlled. Vibrating reed to indicate stylus speed, accuracy about plus or minus 0.2 percent. Pulse length cannot be changed.

One EDO Type 185 (Navy Type UQN) - Sounding cells 0-600 ft., 0-600 fms., 0-6000 fms. Trace resolution on graph: on 600-ft. scale, plus or minus one ft.; on 600 fms. scale, plus or minus one fm; on 6,000 fm. scale, plus or minus ten fms. Stylus run by synchronous motor, Tuning fork source gives speed control 0.05% to 0.001%. Pulse length changes with scale.

One Timefax PDR recorder which operates in conjunction with EDO 185. Sounding scale 400 fms. Trace resolution plus or minus one fm. Sounding at 400 fms. intervals throughout depth range for all depths. Synchronous motor with built-in tuning fork giving speed and accuracy of 0.015%. Pulse length can be changed in two steps.

#### **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One 10 HP dredging winch (Markey) with 5,000' of 3/8" cable, break strength 7 tons. One BT winch (USN) with 3,000' of 3/32" wire, break strength 920 lbs. One oceanographic winch (Markey) with 25,275' of 3/16" wire, break strength 4,500 lbs. Barrage ballon winch (Garwood) with 15,000' of 5/32" wire, break strength 2,600 lbs.

#### **ACOUSTICAL CHARACTERISTICS**

Ship cannot be in noiseless condition. Values for radiated and internal noise levels not available.

#### **LABORATORIES**

An oceanographic laboratory for sea water analysis. Also doubles as photo laboratory for deep-sea camera film processing. Air - conditioned, has AC and DC outlets.

#### **HABITABILITY**

Not capable of navigating in ice. Adequate ventilation and cold storage spaces provided for operation in tropics. Fresh water capacity 38,000 gal. Distillation of 4,000 gal./day in calm weather. No salt water showers.

#### **OTHER FEATURES**

Has four hydrographic launches.

## **TYPE OF OBSERVATIONS**

Hydrographic casts, coring, dredging, biological, magnetic, current surveys, hydrography.

## **REMARKS**

Sufficient personnel to operate three or four launch hydrographic parties, two or three topographic or triangulation parties, and be engaged in ship hydrography simultaneously. Women scientists could be accommodated.

# GERDA

NO PHOTO AVAILABLE

**TYPE:** Wooden hulled, North Sea Trawler.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1949	75'	21'	10'3"			

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
10			3,000 miles	

## COMPLEMENT

CREW	SCIENTIFIC STAFF
3	8

#### **AFFILIATION**

Research vessel for Marine Laboratory of University of Miami. Former Danish yacht redesigned specifically to support exploration in the North Sea.

#### **PROPULSION**

Twin Caterpillar diesels 120 HP.

#### **ELECTRICAL POWER**

No information.

#### **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Sperry loran, fathometer, fish-finding radar, underwater television.

#### **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Hydrographic winch, 16 HP with nearly 1 mile of 7/32" galvanized cable.

#### **ACOUSTICAL CHARACTERISTICS**

No information.

#### **LABORATORIES**

Has a deck laboratory.

#### **HABITABILITY**

No information. Fresh water tank capacity 1,850 gal.

#### **OTHER FEATURES**

Has short ketch rig for steadying at sea (antirolling device). CTD instrument gives continuous record of electrical conductivity of water, and temperature and pressure at various determined depths.

#### **TYPE OF OBSERVATIONS**

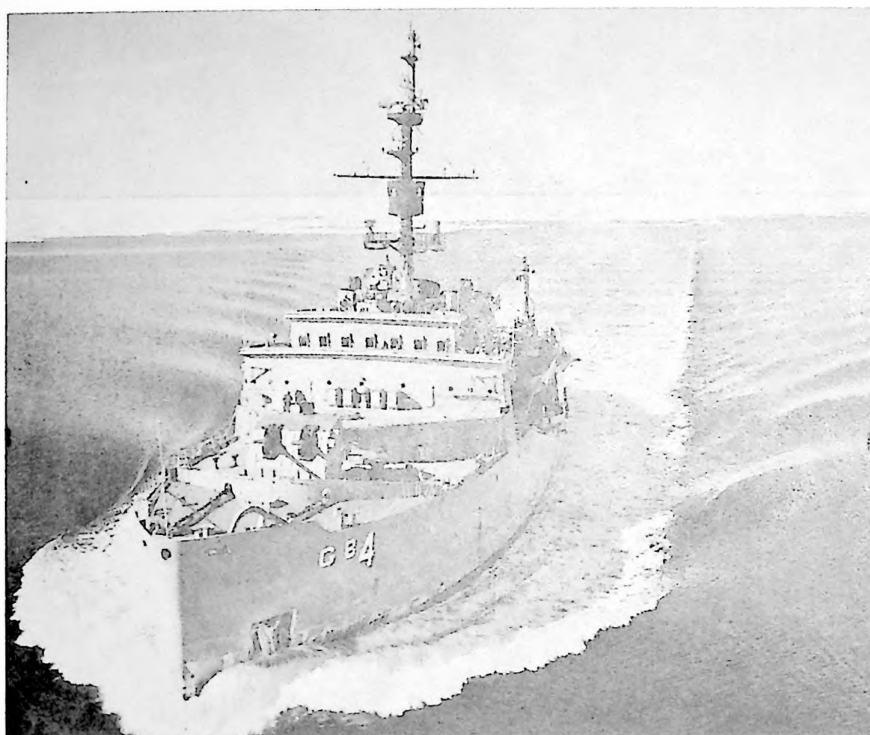
Gerda has winches, cables, and power sufficient to make possible use of all manner of collecting gear.

#### **REMARKS**

None.



# GLACIER



**TYPE:** AGB-4, Icebreaker, steel hulled.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1954	309'	74'	28-1/2' (forward)	8,775 tons (full load)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
12	16			120 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
341	up to 20

## **AFFILIATION**

U. S. Navy.

## **PROPULSION**

Diesel-electric, two fixed-blade propellers, 16,900 HP. Fuel tank capacity 3,150 cu.m.

## **ELECTRICAL POWER**

Ship generates 1600 KW. Adequate AC available.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass, magentic compass, sea search radar, loran, and ship log.

Communication - Standard U. S. Navy transmitters and receivers.

Echosounders - U. S. Navy UQN-1B, with variable ping length.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One BT winch with 3,000' of 3/32" wire. One Lakeshore winch with 20,000' of 5/32" wire.

## **ACOUSTICAL CHARACTERISTICS**

Silent ship services not available.

## **LABORATORIES**

Small wet laboratory facilities with electrical, fresh, and salt water taps.

## **HABITABILITY**

Tropical work not advisable. Fresh water tank capacity, 140 tons. Distillation 60 tons/day. Salt water showers not normally utilized.

## **OTHER FEATURES**

Can break ice up to 20' thick. Carries two helicopters and an LCVP.

Has roll tanks. Scientific investigations can be made up to Sea State 3.

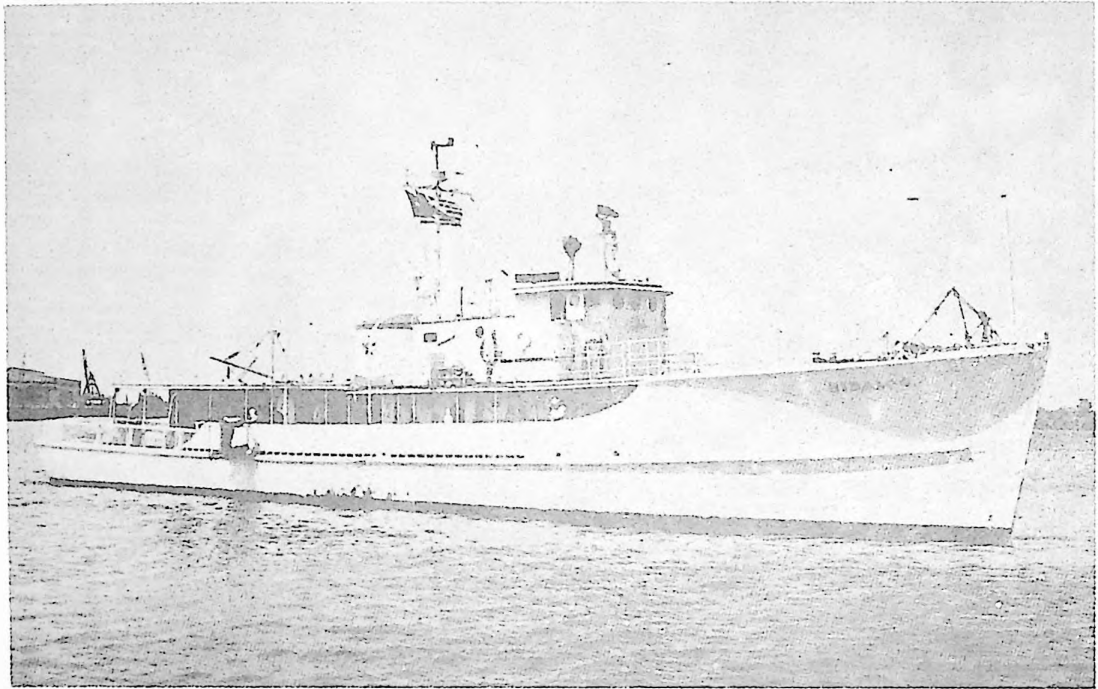
#### **TYPE OF OBSERVATIONS**

Hydrographic casts, light coring and dredging, plankton tows, and BT's.

#### **REMARKS**

Primary mission icebreaking, but generally always has a scientific complement on board. Not good for open sea operations.

# HIDALGO



**TYPE:** Wood hull, ex-Submarine Chaser (PCS).

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1945	136'	24'	10' (aft)	410 tons (full load)	243.3	165

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
	10-1/2	4-1/2	2,000 miles	8 to 10 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
8	14

## **AFFILIATION**

Owned by Texas A. and M. Research Foundation and operated by Department of Oceanography and Meteorology.

## **PROPULSION**

Diesel engine, twin screws, 1,000 HP. Uses Diesel No. 2, at about 35 gal./hr.

## **ELECTRICAL POWER**

Ship generates 60 KW. Converters make available: 115V AC, 2-1/2 KW, 60-cycle, 1-phase; 115V AC, 8 KW, 60-cycle, 1-phase; 115V DC, 60 KW.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Direction finder (RCA-DAE-1), loran (AN/SPN 7A), radar (RCA CR-105B), gyrocompass ("Sperry" MK XIV-5 repeaters), magnetic compass.

Communication - Voice transmitter (RCA-TCP-3), Transmitter (FTI-CW-500W), transmitting frequencies are 2000-1800 KC. EH Scott receiver, RCA-TCP-3 receiver, Hammarlund-SP200X receiver; receiving frequencies are 15-20,000 KC. Crystal frequencies - FCC codes C5, C8, and F46 for CW. Various frequencies for radio-telephone in range 2000-3000 KC.

Echosounders - EDO AN/UQN-1B transmitter-receiver, Precision Depth Recorder, range 6,000 fms., 1% precision. Also has Raytheon DE 103.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Two BT winches (electric) with 2,500' of 3/32" wire each. One hydrographic winch (electric) with 6,800 m. of 5/32" wire. One bottom sampling gear with 300 fms. of 5/32" wire. One hydrographic special winch (diesel hydraulic) with 875' of special cable and chain.

## **ACOUSTICAL CHARACTERISTICS**

With batteries ship can be dead for 24 hours.

## **LABORATORIES**

Has three laboratories, one on bridge deck for radio and electronics (air-conditioned), one deck laboratory for station work and "wet" chemistry and biology, and one "dry" laboratory below main deck for chemical and other work.

### **HABITABILITY**

Temperate and tropical areas. Has 5,000 gal. fresh water capacity.

### **OTHER FEATURES**

Has bilge keels.

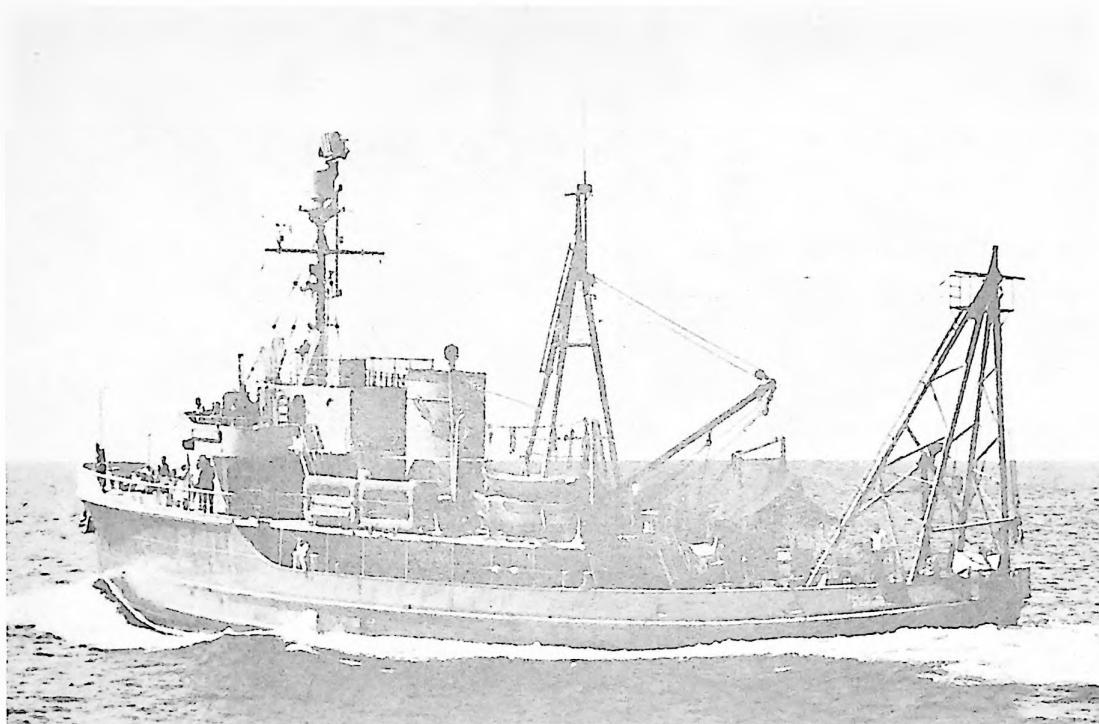
### **TYPE OF OBSERVATIONS**

Hydrographic casts, bottom sampling, currents, geomagnetics, biological, seismic refraction. CO<sub>2</sub> in water and air can be continuously recorded.

### **REMARKS**

None.

# HORIZON



**TYPE:** Ex-U. S. Navy Seagoing Tug - ATA 180, steel hulled.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1944	143'	33'	13-1/2'	900 tons (full load)	636	147

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
11-1/2	12-1/2		7,000 miles	48 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
18	17

## **AFFILIATION**

Owned by Scripps Institution of Oceanography, University of California.

## **PROPULSION**

Diesel-Electric, single fixed-blade screw, 1,900 HP. Uses Type 2-D Mobil fuel or equivalent. Tank capacity 52,000 gal.

## **ELECTRICAL POWER**

Ship generates 120 KW (two 60 KW diesel generators). Normal ship operation requires 30 KW; 12 KW available for scientific work. Available voltages are 115V DC, 120 KW and 115V AC, 60-cycle 12 KW. Standby storage batteries installed for gyrocompass and emergency radio equipment.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Sperry gyrocompass (MK-14 with 5 repeaters), master magnetic compass, NMC-1 Echosounder, SPS-5 and SU radar, QJB echo ranging sonar, loran (Mod. DBS), electro magnetic log, radio direction finder (Mod. DAE-1-NJ9, 400 fms. Fathometer by Submarine Signal Co.)

Communication - Transmitters - ART, TBL-7, TCS-12, Viking, TCP-3, and Lifeboat transmitter (maximum transmitting ranges: 500 miles daytime and 3,000 miles at night). Receivers - RBB, RBC, TCS-1, two RAO-7.

Echosounders - EDO model 185 will record depths permanently on paper or indicate them visually on face of cathode-ray tube. Pulse length changes with scale. PDR (MKV) works in conjunction with EDO to give accurate depths to 4,000 fms. with estimated error of about one part in 3,000.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Two hydrographic winches (Markey) with 25,000' of 3/16" wire on each drum. One dredge winch (Markey, Mod. DES-8) with 20,000' of 1/2" wire. One BT winch with drum capacity for 2,000' of 3/32" wire or 1,500' of 1/8" wire.

## **ACOUSTICAL CHARACTERISTICS**

Not equipped for quiet ship operations. May operate "quiet" for a few hours using kerosene or battery lanterns. Gyrocompass may operate on standby storage battery up to 12 hrs. In dual ship seismic



operations, generally used as firing ship.

### LABORATORIES

Has 1,000 sq. ft. of laboratory space with fresh water, salt water, and electrical taps. Portable vacuum instruments generally available.

### HABITABILITY

Ship is ventilated both naturally and mechanically for reasonable comfort in tropics. Ship also heated for reasonable comfort when operating in temperate zones in winter. Fresh water capacity 18,000 gal., no distillation apparatus; salt water showers are available.

### TYPE OF OBSERVATIONS

With rolling keels ship may perform most observations up to Sea State 5. For every number in excess of 5 ship must reduce speed 15%. A walk-in type reefer (about 240 cu. ft.) for storage of specimens is available.

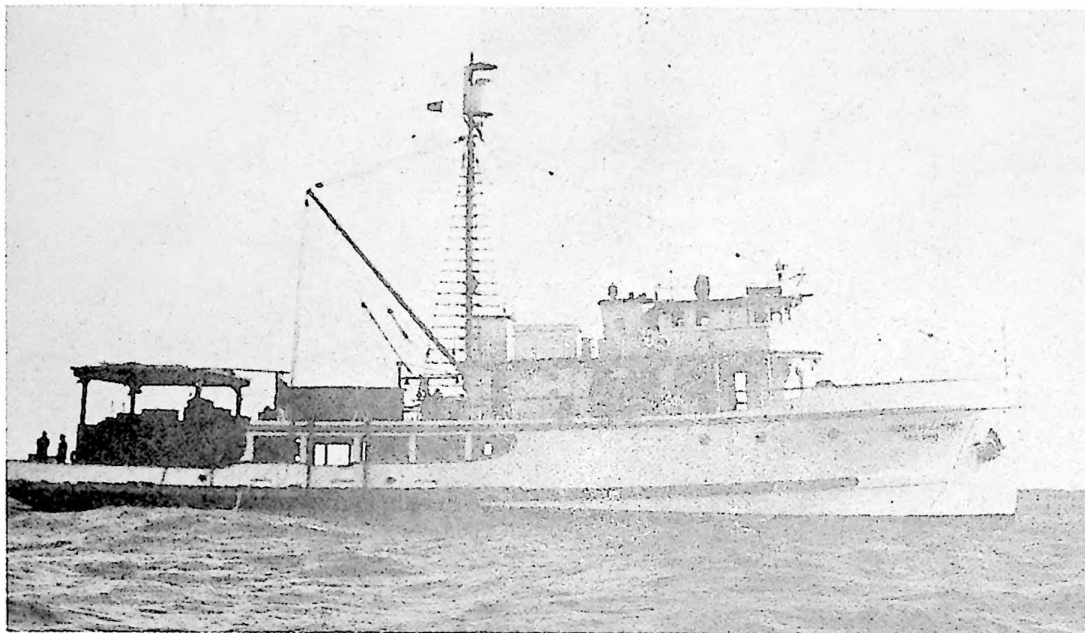
### REMARKS

Coring dredging, and water trawls, buoy work, Nansen bottle casts, net tows, bottom photos, continuous temperature and weather observations, and seismic firing.

### OTHER FEATURES

Has large "A" - Frame for heavy coring and dredging. Accommodations for two women may be arranged. Converted for research in 1948. Has an ammunition storage room with capacity of 25 tons.

# HUGH M. SMITH



**TYPE:** Wooden hulled, Tuna Clipper, ex-U. S. Navy YP-635. Converted for research by U. S. Fish and Wildlife Service.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1945	128'	29'	14' (full)	561 tons (full)	392	190

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
9	10	3	10,000 miles	45 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
14	8

## **AFFILIATION**

Owned by U. S. Fish and Wildlife Service and operated by Scripps Institution of Oceanography on loan basis since June 1959.

## **PROPULSION**

Diesel, direct reversible, single fixed-blade screw, 560 HP. Uses Type 2-D Mobil fuel diesel or equivalent. Tank capacity 38,800 gal.

## **ELECTRICAL POWER**

Ship generates 200 KW DC (two 100 KW DC generators) and 15 KW AC, 115V 60-cycle (two 7-1/2 KW motor generators). Normal ship operation requires 23 KW. Available for scientific work: 177 KW DC, 115V, and 13 KW AC, 115V, 60-cycle.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass (Sperry MK-XIV with 3 repeaters), magnetic compass, Bendix fathometer (250 and 1,000 fms. dual range with recorder) Bendix 400 fms. supersonic depth recorder, radar (RCA Mod. CR 103, 20 mile range).

Communication - Transmitters - ART 13 voice and CW 50W, Viking 1 (2-30 MC) voice and CW 100W, TCP-2 (2-3 MC) voice only 75W, and TCS-13 1500-1200 KC. Receivers - HRO-60, RAO-7, and RBC-2

Echosounders - EDO model 185 will record depths permanently on paper or indicate them visually on face of cathode-ray tube. Pulse length changes with scale. PDR (MK V) used in conjunction with EDO to give accurate depths to 4,000 fms. with an estimated error of about one part in 3,000. PDR is placed aboard when needed.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One hydrographic winch (Markey) with 25,000' of 3/16" wire. One dredge winch (Tacoma Boat Building Company), has double drum, one with 7,000' of 3/8" wire and one with 3,000' of 1/4" wire. One BT winch, 5 HP motor and hydraulic controls.

## **ACOUSTICAL CHARACTERISTICS**

Not equipped for quiet ship operations. May operate "quiet" for a few hours using kerosene or battery lanterns. Gyrocompass may be operated on standby storage batteries up to 12 hrs.

## LABORATORIES

One permanent laboratory (108 sq. ft.) with hot and cold fresh water and salt water taps, many electrical outlets and compressed air. A portable laboratory may be placed aboard when needed with fresh and salt water taps and electrical outlets.

## HABITABILITY

Ship has a boiler for circulating hot water thru radiators. Ship is ventilated both naturally and mechanically. Carries 12,300 gal. fresh water, no distillation facilities.

## OTHER FEATURES

Portable freezers available for scientific use. No antirolling devices, but ship can perform most oceanographic observations up to Sea State 5.

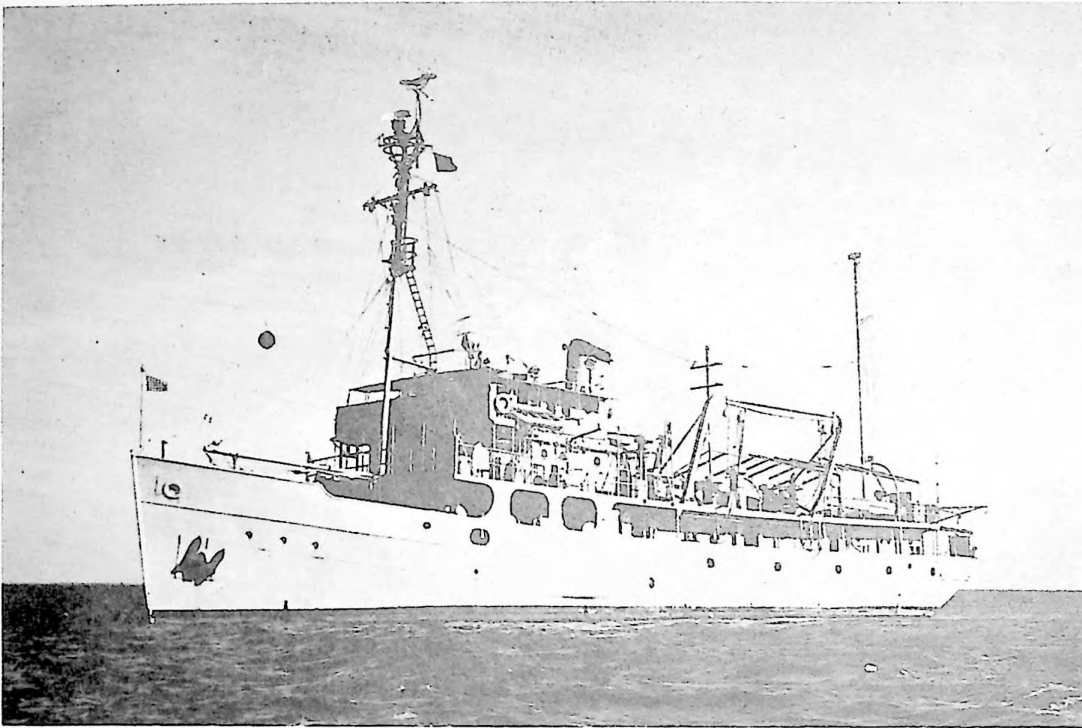
## TYPE OF OBSERVATIONS

Hydrographic casts, net tows, phytoplankton tows, bottom sampling, coring, dredging, underway and GEK observations.

## REMARKS

By using bait wells ship can carry considerable amount of explosives for seismic work. Two or three women could be accommodated.

## HYDROGRAPHER



**TYPE:** Steel hulled, designed and built as a Hydrographic Survey Ship.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1930	165.5'	31.5'	14.0' (mean)	1,100 tons (full load)		

### PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
10		4		12 to 20 days

### COMPLEMENT

CREW	SCIENTIFIC STAFF
38	10 (including officers)

## **AFFILIATION**

U. S. Coast and Geodetic Survey.

## **PROPULSION**

Two diesel-electric engines, with single, fixed blade propeller, delivering 900 IHP. Uses No. 2 diesel fuel. Fuel consumption 36 gal./hr. for main propulsion plant and 7 gal./hr. for auxiliaries.

## **ELECTRICAL POWER**

Ship generates 760 KW. Normal ship operations require 600 KW. Seven and one-half KW available for scientific apparatus. Characteristics are 60 KW 120/240 DC; 1 KW 115V AC 400-cycle; 1/2 KW 28V DC; 4-3/4 KW 120V AC 60-cycle; and two banks of 12V DC batteries.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass, magnetic compass, radar, shoran, loran, raydist, revolution counter.

Communication - Transmitters - TBL-7, 200W 175-600 KC and 2-18 MC; Johnson Viking II (four), 100W, 1.8-30 MC; TCS-12 (five) 25W, 1.2-12 MC; Johnson Viking I (three), 100W, 1.8-30 MC.

Receivers - National HRO-60, .48-30 MC; RCA AR-8510, 15-640 KC; TCS (five), 1.5-12 MC; Hallicrafter SX-71 (six), 0.5-30 MC; 835-8 Zenith, .55-1.5 MC; RBO, .54-15 MC; and RAO-7, 15-30 MC.

Echosounders - Three shoal water Submarine Signal Company Type 808, with two sounding scales, ft. to fms. Four scale ranges of 55 ft. or fms. each. Twenty ft. or fms. overlap between scales. Trace resolution of graph plus or minus 0.1 ft. or fms. Stylus speed governor controlled. Vibrating reed indicates stylus speed, accuracy about plus or minus 0.2%. Pulse length cannot be changed.

One EDO Type 185 (Navy Type UQN) - Sounding cells 0-600 ft., 0-600 fms., 0-6,000 fms. Trace resolution on graph: on 600-ft. scale, plus or minus one foot; on 600-fms. scale, plus or minus one fathom; on 6,000-fms. scale, plus or minus ten fms. Stylus run by a synchronous motor. Tuning fork source gives speed control 0.05% to 0.001%. Pulse length changes with scale. Hydrographic launches equipped with EDO Type 255C shoal water echosounders, with two sounding scales (ft. or fms.). Range of 230 ft. or fms. Four scale ranges of 65 ft. or fms. each. Ten ft. or fms. overlap between scales. Trace resolution of graph plus or minus 0.1 ft. or fms. Stylus run from synchronous motor, tuning fork source gives speed control from 0.05% to 0.001%. Pulse length can be changed, but requires circuit changes.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One barrage ballon winch, Model BB-1 (Marmon-Harrington) with 2,000 fms. of 3/16" wire, used for oceanographic observations. One BT winch (Star Electric Motor) with 3/32" wire. One wire sounding machine (Diehl Co.) with .063" wire.

## **ACOUSTICAL CHARACTERISTICS**

Cannot be put in noiseless condition. Values for radiated and internal noise levels not available.

## **LABORATORIES**

None, all available space used for charting operations.

## **HABITABILITY**

Cannot navigate in ice. Endurance dependent upon fresh water. Fresh water capacity 30,000 gal. Daily consumption 1,500 gal. No distillation apparatus. No salt water showers.

## **OTHER FEATURES**

Equipped with rolling keels on each side. Operations limited to Sea State 3. Carries two hydrographic launches.

## **TYPE OF OBSERVATIONS**

Primarily hydrographic ship with limited oceanographic capabilities (currents, bottom sediments, BT).

## **REMARKS**

Sufficient personnel to man one or two shore stations, and do ship and launch hydrography simultaneously.

# JOSIAH WILLARD GIBBS

NO PHOTO AVAILABLE

TYPE: T-AGOR, steel hulled, former Seaplane Tender (AVP51).

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1942	310'9"	42'	14'6" (aft)	2800 tons (full load)	2,266	925

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
15	18.5	5 (less with outboard)	8,000 miles (at cruising speed)	4 months

## COMPLEMENT

CREW	SCIENTIFIC STAFF
48	24



## **AFFILIATION**

Principal research vessel of Hudson Laboratories of Columbia University under contract to Office of Naval Research. Largest and one of newest of United States oceanographic vessels.

## **PROPULSION**

Main engine Fairbanks-Morse diesel, 380 8-1/8 cylinder, opposed piston, 720 r.p.m., 160 HP. In addition to two main propellers, has Murray and Tregurtha outboard motor as auxiliary. With this, precise maneuverability at speeds 0 to 5 knots possible. At cruising speed, fuel consumption about 6,000 gal. Marine diesel per day. Maximum fuel capacity 175,383 gal.

## **ELECTRICAL POWER**

Four AC generators deliver 200 KW and 100 KW to aft ship's service bus bar and 200 and 100 KW to forward distribution bar. Two 52 HP motor generators deliver 35 KW, 125V DC power. Silent ship power from two 25 KW, 440V, 3 phase, 60-cycle AC diesel driven silent ship generators, one for ship's essential power and one for electronic laboratory. Laboratory supply 440V, 3 phase, 60-cycle AC from either normal bus of ship's service switchboard, laboratory 25 KW diesel generator, or ship's 25 KW diesel generator. Battery distribution can be made from generator control and distribution switchboard on "as needed" basis.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Main navigational equipment - Dead reckoning analyzer Class III, MKVI, Model I; dead reckoning tracer Class III, MKVII, Model II; Sperry radar indicator MKIII; Bendix wind and gyro course indicator; two main engine RPM indicators; Bendix rudder control indicator; Pitometer log speed indicator; Sperry gyro; gyrocompass repeater MKXIX, Model 6; Sperry (LORAN) indicator-receiver.

Communication Equipment - Collins 30-k-5 transmitters, four AN/URR-39 radio receivers. Ten-station intercom system services ship. Each station a master. Possible to hold conference with several stations simultaneously.

Echosounders - EDO depth recorder indicator Model 185A, Precision Depth Recorder (TIMES) LGO MKV. Using PDR and EDO together, accurate depths to 6,000 fms. obtained. Length of ping adjustable on PDR.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

All equipment located on main deck aft. "A" Frame - two interchangeable units with safe working loads of 7,000 and 5,000 lbs. "U" Frame - can support 30,000 lbs. static towline pull when in outboard position at 45° above horizontal. BT boom and winch - working load of 1,200 lbs. aft with 400 lbs. vertical component. Auxiliary winch - can spool 5,000 lineal feet of 1/2" diameter wire. Crane or boat boom rated at 20,000 lbs.

## **ACOUSTICAL CHARACTERISTICS**

Silent ship operation possible. Food spoilage in ship's refrigeration system prime factor in silent ship operation. Safe period - 10 hrs. If more time required, must restore normal ship's power for about 12 hrs., then resume silent ship operations.

## **LABORATORIES**

Six laboratories in addition to scientists' machine shop, darkroom, and superstructure deck locker to be used for experimental stowage or work.

## **HABITABILITY**

Ship prepared to work in all navigable waters. Maximum fresh water capacity 22,725 gal. Distillation capacity 30 tons/day. Adequate living space available for crew and scientists.

## **OTHER FEATURES**

Ship has rolling chocks to reduce roll. Will be equipped with largest and heaviest deep-sea winch ever used by United States oceanographic research vessel. Winch will be capable of handling up to 40,000' of wire rope and lowering and raising as much as 20 tons of equipment.

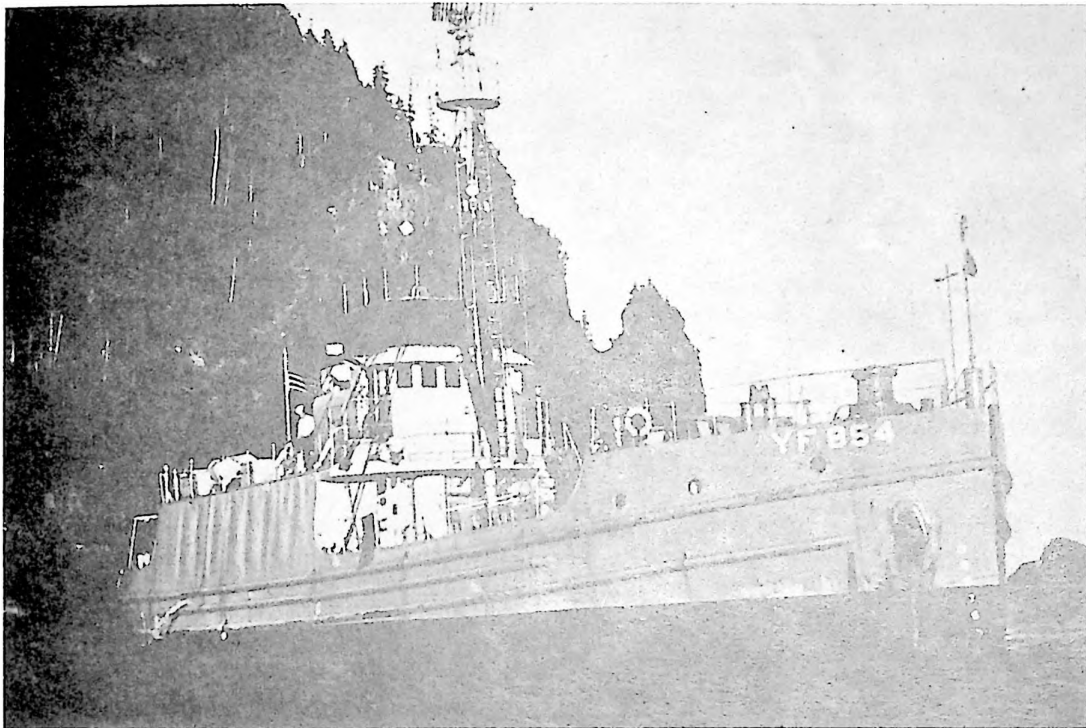
## **TYPE OF OBSERVATIONS**

Used primarily for geophysical and sound studies, but is capable of all types of oceanographic observations.

## **REMARKS**

Named after Professor Josiah Willard Gibbs (1839-1903), generally considered to be America's greatest theoretical physicist. Reconverted as oceanographic research vessel in 1958. Provisions can be made for women scientists.

# LITTLEHALES



**TYPE:** AGSC-15, ex-Yard Freighter, steel hulled.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1945	132'	31'	5'10" (aft)	600 tons (full load)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
9	10	5		14 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
21	no bunking facilities

## **AFFILIATION**

U. S. Navy

## **PROPULSION**

Diesel engine, twin shaft fixed-blade propellers, 300 HP. Fuel tank capacity 55 cu. m.

## **ELECTRICAL POWER**

Ship generates 120 KW DC. Normal ship operations require 7-1/2 KW AC. Available for scientific purposes 5 KW. Converters make the following voltages available: 36V DC, 240V DC, 120V AC, 230V AC.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass, magnetic compass, sea search radar, loran, shoran, ship log.

Communication - Standard U. S. Navy transmitters and receivers. No teletype.

Echounders - Navy UQN-1B, with variable ping length, and NJ3.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One BT winch with 3,000' of 3/32" wire. One Tulsa winch with Vickers pump and motor containing 1,500' of 5/32" wire.

## **ACOUSTICAL CHARACTERISTICS**

Silent ship services available for short-time periods.

## **LABORATORIES**

One multipurpose laboratory.

## **HABITABILITY**

Can be used in temperate and tropical areas. No air conditioning. Fresh water capacity, 13 tons. No distilling apparatus. Salt water showers not normally utilized. No sleeping facilities for scientists.

### **OTHER FEATURES**

Has an outboard motor boat, large cargo boom and large storage space.  
Bilge keels, can operate up to Sea State 4.

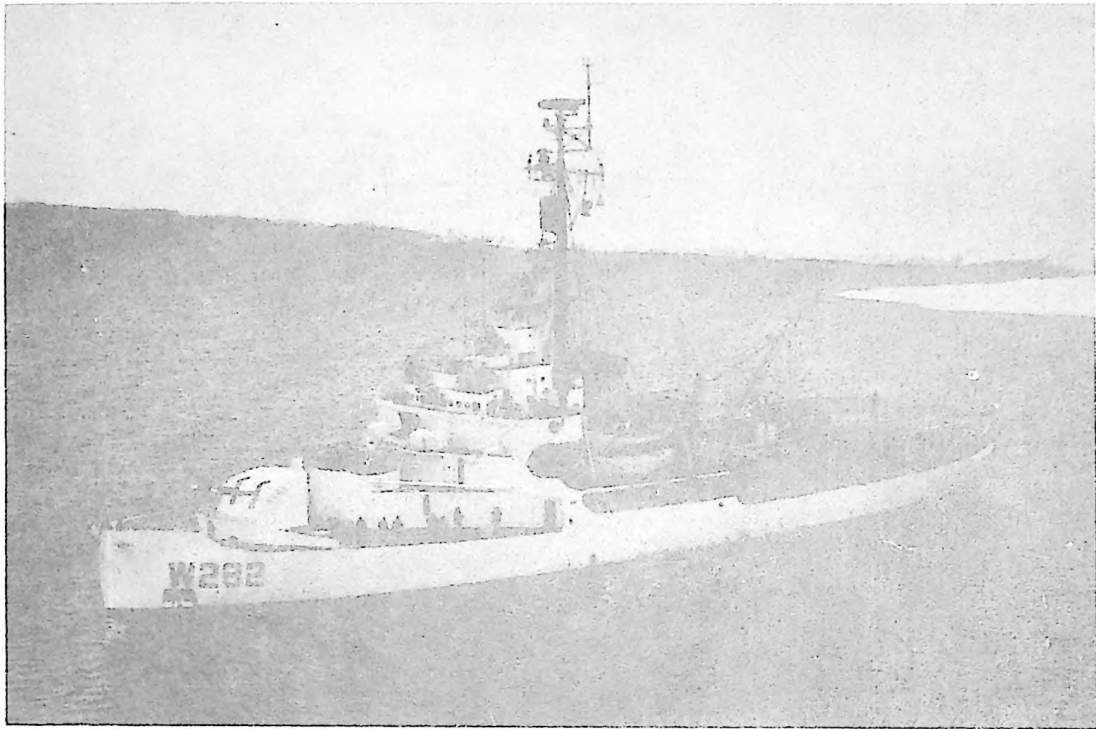
### **TYPE OF OBSERVATIONS**

Shallow hydrographic casts, coring, hydrography, and acoustic, and ambient noise measurements.

### **REMARKS**

Poor sea-keeping characteristics makes open sea survey work impracticable.

# NORTHWIND



**TYPE:** WAGB-282, Icebreaker, steel hulled.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1945	269'	63'	29' (aft)	6500 tons (full load)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
14	16	2	11,000 miles	120 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
234	up to 20

## **AFFILIATION**

U. S. Coast Guard.

## **PROPULSION**

Diesel-electric direct drive propulsion plant, made up of six diesel engines capable of producing 5,000 HP for each of her twin fixed-blade screws. Fuel tank capacity 2,650 cu. m.

## **ELECTRICAL POWER**

Ship generates 1,250 KW. Adequate AC available.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass, magnetic compass, sea search radar, loran, ship log.

Communication - Standard U. S. Navy transmitters and receivers.

Echosounders - Navy UQN-1C with variable ping length.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One BT winch with 3,000' of 3/32" wire. One Wheeler or Lakeshore winch with 20,000' of 5/32" wire.

## **ACOUSTICAL CHARACTERISTICS**

Quiet ship services are not available.

## **LABORATORIES**

Wet laboratory with electrical, fresh, and salt water taps. Aerology laboratory.

## **HABITABILITY**

Tropical work not advisable. Salt water showers not normally utilized. Fresh water capacity 215 tons. Distillation 38 tons/day. Can carry dry provisions for over 300 days of steaming, and frozen meats and foods for over 200 days at sea.

### OTHER FEATURES

Can break ice up to 20' thick; equipped with two helicopters. Has two LCVP's on board. Has antirolling-roll tanks. Can perform scientific investigations in seas up to Sea State 3.

### TYPE OF OBSERVATIONS

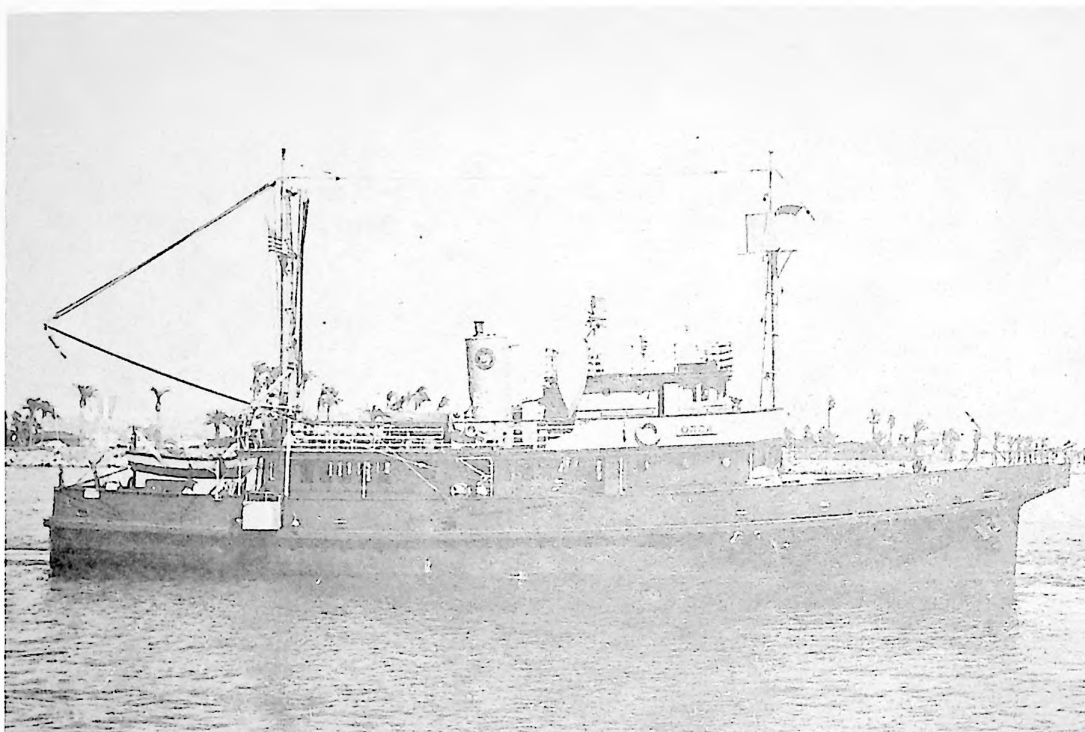
Hydrographic casts, light coring and dredging, plankton tows, BT's and continuous temperature recordings. Primary mission icebreaking but generally always has scientific complement on board.

### REMARKS

Open sea operations not advisable.



# ORCA



**TYPE:** Iron hulled, ex-U. S. Coast Guard Patrol Vessel YP42, later used as yacht and for limited research.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1926	98'	23'	7-1/2' (full)	205 tons (full)	200	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
8-1/2	9-1/2	2	3,000 miles	18 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
12	10

## **AFFILIATION**

Purchased by Scripps Institution of Oceanography, University of California in 1956 for use in oceanographic research.

## **PROPULSION**

Twin Diesel, full reversible, twin fixed-blade screws, 270 HP. Uses Type 2-D, Mobil fuel diesel or equivalent. Fuel capacity 6,400 gal.

## **ELECTRICAL POWER**

Ship generates 60 KW (two 30 KW auxiliary 115V DC generators) and 7 KW AC (one 5 KW and one 2 KW, 115V AC single phase generators). Normal ship operation requires 10 KW, 115V DC and 4 KW, 115V AC. For scientific work, 50 KW, 115V DC and 30 KW, 115V AC, 60-cycle, single phase. No standby batteries available for scientific work.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Sperry MK 18 gyrocompass with 5 repeaters, master magnetic compass, SO-1 radar, NJ-8 echosounder (300 fms.)

Communication - Transmitter ART-13 (2-18 MC) voice and CW 50W, TCP-1 (2-3 MC) voice only 75W, TCS (15-12 MC) voice and CW 75W, and Viking (2-30 MC) voice and CW 100W.

Receivers - RAO-7, two RBM-5, and RBS-2.

Echosounders - EDO model 185 and PDR (MKV) when used together give very accurate depths to 4,000 fms., with an error of about 1 part in 3,000. EDO by itself determines depths to 6,000 fms. with less accuracy, pulse length changes with scale.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One hydrographic winch (Markey) with 25,000' of 3/16" wire. One BT winch with 1,500' of 3/32" wire or 1,200' of 1/8" wire.

## **ACOUSTICAL CHARACTERISTICS**

Ship may lay to for 4 hr. period. Does not have standby batteries for gyrocompass or lights. In seismic work uses either sparker or gas gun, both of which have portable generator for power.

## LABORATORIES

One laboratory (183 sq. ft.) with salt water, hot and cold fresh water, and AC and DC electrical outlets.

## HABITABILITY

No heating or air-conditioning. Carries 2,700 gal. fresh water, no distillation apparatus. Salt water showers available.

## OTHER FEATURES

Portable reefer placed on board when needed for specimens. No antirolling devices, but ship can do oceanographic work up to Sea State 5.

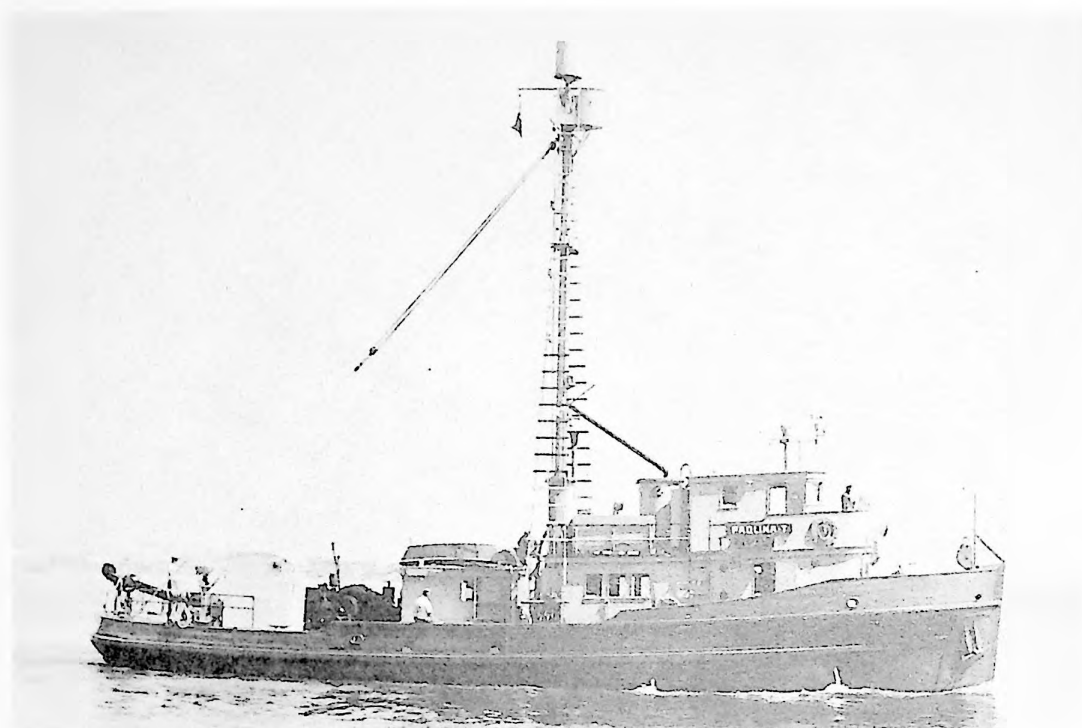
## TYPE OF OBSERVATIONS

Hydrographic cast, bottom sampling, coring, dredging, and net tows. Seismic, Moran, and sonoprobe work. Continuous temperature recordings, BT, GEK.

## REMARKS

On after end of boat deck is ship control station, where deck officer can watch inclinometer on wire when making net tows, thus being able to keep angle at approximately 45° during tow. As many as three women have been accommodated aboard on expeditions.

# PAOLINA-T



**TYPE:** Purse Seiner, converted for oceanographic research, wood hulled.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1944	80'3"	22'	9'9" (full)	170 tons (full)	110.7	57

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
8-1/2	9	2-1/2	2,450 miles	30 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
9	5

## **AFFILIATION**

Scripps Institution of Oceanography, University of California.

## **PROPULSION**

Diesel, clutch reversing, single fixed-blade propeller, 250 HP.  
Uses Type 2-D Mobil fuel diesel, or equivalent, tank capacity 5,400 gal.

## **ELECTRICAL POWER**

Ship generates 60 KW, 115V DC and 5 KW, 115V AC 60-cycle. Normal operation requires 5 KW DC. Available for scientific work: 50 KW, 115V DC and 5 KW, 115V AC, 60-cycle. No battery power for scientific equipment.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass, magnetic compass, SU radar, DAS loran, NMC fathometer.

Communication - RAO 7 receiver 1,300-30,000 KC, RBC receiver 4-27 MC., TCP-2 transmitter-receiver 2,000-3,000 KC., and TDF transmitter 2,000-9,400 KC.

Echosounders- NMC-1 (0 to 400 fms. and 0 to 2,000 fms.), sea scanner (0 to 400 ft., 0 to 800 ft. and 0 to 1,600 ft.)

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One hydrographic winch (Markey Mod. DES-3) with 25,000' of 3/16" wire. Ship will accomodate GEK and BT winches as needed for specific work.

## **ACOUSTICAL CHARACTERISTICS**

Ship may be "quiet" for 24 hrs. by using kerosene lanterns. Gyro-compass equipped with standby batteries with 12 hrs. capacity..

## **LABORATORIES**

One laboratory (90 sq. ft.) with fresh and salt water taps and electrical outlets.

## HABITABILITY

No heating or air-conditioning. Ship suitable for temperate climates only. Endurance of 30 days based on provisions and water, but for continuous cruising at 8-1/2 kts. with 15% reserve fuel on board, endurance only 14-1/2 days. Fresh water capacity 3,000 gal., no distillation apparatus, no salt water showers.

## OTHER FEATURES

Has 33', 5-ton capacity boom and associated winches which can work from stern area and over either side. No antirolling devices. Ship operates in rougher seas at 15% reduced speed for each number in excess of 4 Beaufort.

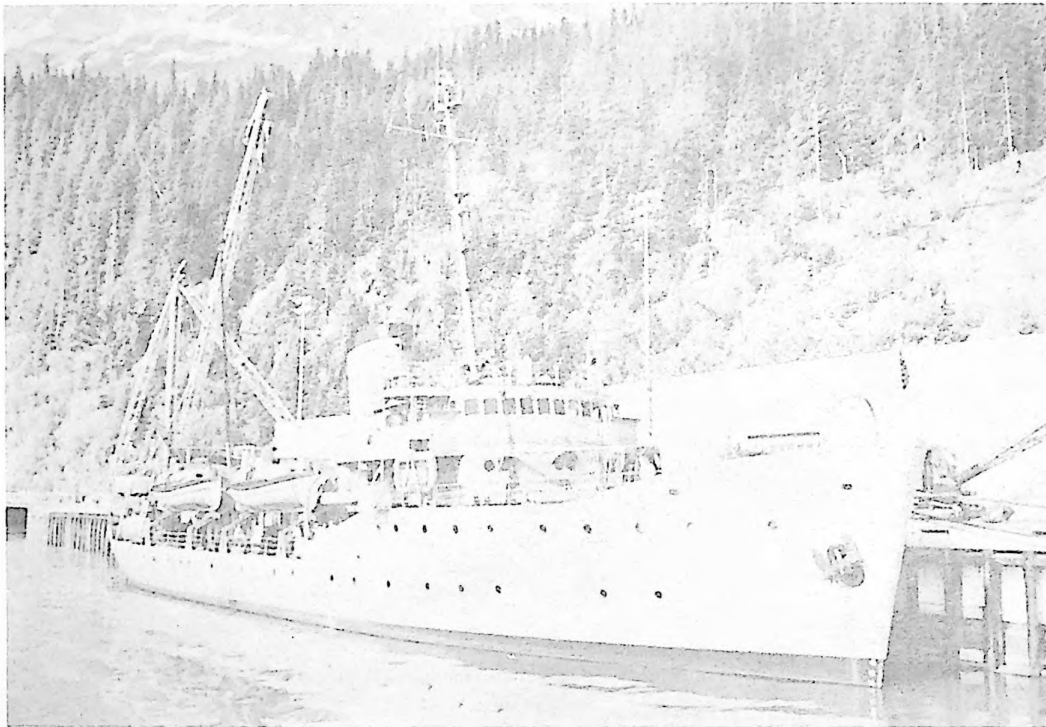
## TYPE OF OBSERVATIONS

Hydrographic casts, net tows, light bottom sampling, coring, dredging, GEK and other underwater observations.

## REMARKS

Large fantail area can accomodate portable laboratory and has made ship especially suitable for studies involving handling of large and/or heavy instruments. SIO purchased and converted ship for oceanographic research in 1948.

# PATHFINDER



**TYPE:** Steel hulled; designed and built as a Hydrographic Survey Ship.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1942	229.3'	39.0'	15.5' (mean)	2000 tons (full load)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
13	14.5	2	4000 miles	48 days (at anchor) 13 days (cruising)

## COMPLEMENT

CREW	SCIENTIFIC STAFF
79	19 (including officers)

## **AFFILIATION**

U. S. Coast and Geodetic Survey.

## **PROPULSION**

Steam turbine, single fixed-blade propeller, 200 IHP. Uses turbine "Navy Special." Tank capacity 92,000 gal. but 20,000 gal. required for stability. Uses 1,500 gal./day at anchor and 5,500 gal./day at service speed. Diesel oil used in launches and galley ranges. "Bunker C" or Grade 6 fuel oil cannot be used.

## **ELECTRICAL POWER**

Ship generates 200 KW, 100V DC. Normal operation requires 84 KW. For scientific apparatus 4 KW, 115V, 60-cycle, AC available. Alternating current obtained by conversion from DC. No direct current available from batteries.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Sperry gyrocompass, magnetic compass, ship log, revolution counter, radar (RCA Model CR-104A) and loran (EDO Model 262).

Communication - Transmitters - TBL-13, 200W 175-18100 KC; TAJ-19, 500W, 175-600 KC; Fisher, 100W, 2-9 MC; Viking (four) 100W, 2-30 MC; TCS-12 Transceiver (six) 15W, 1.5-12 MC.

Receivers - National HRO-60, 1.7-30 MC; TCS-14 (Five), 1.5-12 MC; RAL, 0.3-23 MC; AR 8506B 85 KC 25 MC; RAK (two) 15-600 KC; RCA-OB-431 (three), .55-19 MC.

Echosounders - Two shoal water Submarine Signal Company Type 808. Has two sounding scales, ft. to fms. Four scale ranges of 55 ft. or fms. each. Twenty ft. or fms. overlap between scales. Trace resolution of graph plus or minus 0.1 ft. or fms. Stylus speed governor controlled. Vibrating reed to indicate stylus speed, accuracy about plus or minus 0.2%. Pulse length cannot be changed.

One EDO Type 185 (Navy Type UQN) - Sounding cells 0-600 ft., 0-600 fms., 0-6,000 fms. Trace resolution on graph: on 600 ft. scale, plus or minus one foot; on 600-fms. scale, plus or minus one fathom; on 6,000 fms. scale, plus or minus ten fms. Stylus run by synchronous motor. Tuning fork source gives speed control 0.05% to 0.001%. Pulse length changes with scale.

One Timefax PDR Recorder, operates in conjunction with EDO 185. Sounding scale 400 fms. Trace resolution plus or minus one fathom. Sounding at 400 fms. intervals throughout depth range for all depths. Synchronous motor with built-in tuning fork giving speed and accuracy of 0.015%. Pulse length can be changed in two steps.



## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One electric BT winch. One electric barrage ballon winch modified for hydrographic winch. One C. H. Wheeler electro-hydraulic oceanographic winch with 30,000' of 5/32" wire. One heavy winch for dredging with 1,000' of 5/8" wire.

## **ACOUSTICAL CHARACTERISTICS**

Ship cannot be put in a noiseless condition. Values for radiated and internal noise levels not available.

## **LABORATORIES**

Oceanography laboratory used for sea water analysis. Has electrical power.

## **HABITABILITY**

Cannot navigate in ice. Fresh water distillation 4,000 gal./day. Potable water tank capacity 28,000 gal.; feed water tank 20,000 gal. No salt water showers.

## **OTHER FEATURES**

Has a rolling keel on each side of hull. Oceanographic operations can be performed up to Sea State 4.

## **TYPE OF OBSERVATIONS**

Hydrographic casts, coring, dredging, biological, and current surveys, hydrography.

## **REMARKS**

Sufficient personnel to operate three or four launch hydrographic parties, two or three topographic or triangulation parties, and ship hydrography simultaneously. Women scientists could be accommodated.

# PHALAROPE II

NO PHOTO AVAILABLE

**TYPE:** Wooden hull, Stock Model Fisherman.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1932	40-1/2'	12-1/2'	4-1/2'	12 tons		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
8	8	2		1 day

## COMPLEMENT

CREW	SCIENTIFIC STAFF
1	up to 6

## **AFFILIATION**

U. S. Bureau of Commercial Fisheries Biological Laboratory, Boothbay Harbor, Maine.

## **PROPULSION**

Diesel engine, single fixed-blade propeller, 225 HP. Fuel capacity 400 gal.

## **ELECTRICAL POWER**

Auxiliary gasoline generator produces 1/2 KW. Converter yields 32V DC only.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Magnetic compass, Apeles AE56 (65W) radio to be installed. Raytheon Cadet echosounder (ranges 0-150 and 150-300 ft.).

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One double-drum winch (Ideal Windlass Co. model TR) designed for trawling and dredging. Each drum holds 500' of 3/8" cable.

## **ACOUSTICAL CHARACTERISTICS**

Noise level unknown, but can be put in noiseless condition for special listening for as long as vessel can remain at sea and on station.

## **LABORATORIES**

None.

## **HABITABILITY**

Has no heating system, no distillation equipment, carries 50 gal. of water. Inadequate quarters for overnight trip.

## **OTHER FEATURES**

None.

**TYPE OF OBSERVATIONS**

Best suited for coastal and estuarine work. Hydrographic casts, bottom sampling, trawling, dredging, coring.

**REMARKS**

None.

# PIONEER



**TYPE:** Former Navy Seaplane Tender, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1943	311.6'	41.0'	13.8'	2,600 tons (full)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
13	18-1/2	6	10,000 miles	30 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
118 total	

## **AFFILIATION**

U. S. Coast and Geodetic Survey.

## **PROPULSION**

Twin diesel, two fixed-blade screws, 4000 IHP. Uses Navy standard diesel fuel or any good grade commercial #1 or #2 marine diesel.

## **ELECTRICAL POWER**

Ship generates 600 KVA (two 100 KVA and two 200 KVA generators). Normal ship operation requires 230 KVA. Available for scientific work, 70 KVA. Ship's line voltage fluctuates about 5V, and cycles fluctuate between 59.4 to 60.5 c.p.s. due to automatic cutting in of various motors. These are momentary fluctuations. Primary ship voltage 440V AC, 60-cycle, 3-phase. This can be controlled by regulated transformers down to 115V. No battery system available. One 5 KW and two 35 KW DC generators make available 115V DC.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Radar (40-mile range), gyrocompass; loran-A; loran-C; Pitometer log for distance measuring; revolution counters to supplement log; sextants; magnetic compass; shoran.

Communication - Two 1000W transmitters capable of transmitting on wide range of KC frequencies. Northern 180W radio transmits on 2182-8364 KC and receives up to 12 MC. Has receivers capable of receiving frequencies from 85 KC to 30 MC. Teletype and number of small low-power battery sets for shore parties and launches.

Echosounders - Two deep-water EDO Type 185 (Navy UQN), two Submarine Signal Company Type 808, two Timefax PDR recorders which operate in conjunction with EDO. Launches equipped with 808 type echosounders.

Characteristics of instruments:

EDO Type 185 (Navy UQN). Sounding scales: 0-600 ft., 0-600 fms., 0-6,000 fms. Trace resolution on graph: on 600 ft. scale, plus or minus one ft.; on 600 fms. scale, plus or minus one fm.; on 6,000-fms. scale, plus or minus ten fms.

Submarine Signal Company Type 808. Two sounding scales ft. or fms. Total range of 160 ft. or fms. Four scale ranges of 55 ft. or fms. each. Twenty ft. or fms. overlap between scales. Trace resolution of graph plus or minus 0.1 ft. or fms. Stylus speed governor controlled. Vibrating reed to indicate stylus speed--accuracy about plus or minus 0.2%. Pulse length cannot be changed.

Timefax PDR Recorder. Sounding scale of 400 fms. Trace resolution plus or minus one fm. Sounding at 400-fm. intervals throughout depth range for all depths. Synchronous motor with built-in tuning fork giving speed accuracy of 0.015%. Pulse length can be changed in two steps.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Hydraulic oceanographic winch (Wheeler) with over 30,000' of 5/32" wire. One 3 HP BT winch (another similar one held in reserve). One barrage balloon winch (Garwood) with 30,000' of 5/32" wire (used in emergency for oceanographic work). One DC-powered wire sounding machine.

## **ACOUSTICAL CHARACTERISTICS**

Ship cannot be put in noiseless condition.

## **LABORATORIES**

One well-equipped oceanographic laboratory for salinity, dissolved oxygen, and other routine analyses.

## **HABITABILITY**

Not structurally strengthened for ice navigation. Generally operates in tropical waters. Fresh water capacity 42,000 gal. Distillation capacity about 8,000 gal./day. No salt water showers. Endurance of 30 days based on fuel consumption; can carry food for six month's supply.

## **OTHER FEATURES**

Has rolling chocks. Carries 4 hydrographic launches.

## **TYPE OF OBSERVATIONS**

Continuous bottom profile, BT, bottom samples (snapper, coring, dredging), current observations (Roberts radio current meters), Nansen casts, plankton tows, magnetic, gravity and weather observations.

## **REMARKS**

Personnel sufficient to operate 3 or 4 launch hydrographic parties, two or three topographic or triangulation parties, and be engaged in ship hydrography simultaneously. Installation of deep sea anchoring and coring winch (Western Gear Corporation) will greatly increase oceanographic capabilities. This unit will use 45,000' of 3/8" to 3/4" tapered wire rope.

# PREVAIL

NO PHOTO AVAILABLE

**TYPE:** AGS-20, ex-Minesweeper, steel hulled.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1941	220'	32'	10'4" (aft)	1220 tons (full load)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
18				30 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
105	4



## **AFFILIATION**

U. S. Navy.

## **PROPULSION**

Main engine diesel-electric, single fixed-blade propeller, 3,532 HP.  
Fuel tank capacity 250 cu. m.

## **ELECTRICAL POWER**

Ship generates 300 KW. Adequate AC available.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass, magnetic compass, loran, shoran, ship log.

Communication - Standard U. S. Navy transmitters and receivers.

Echosounders - Navy UQN-1B, with variable ping length.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One BT winch with 3,000' of 3/32" wire. One Wheeler winch with 20,000' of 5/32" wire.

## **ACOUSTICAL CHARACTERISTICS**

No facilities for quiet ship.

## **LABORATORIES**

No space available, one small drafting room used for working space.

## **HABITABILITY**

Can be used in temperate and tropical areas, no air-conditioning. Scientific living and working space inadequate. Salt water showers available but not normally utilized. Fresh water capacity 57 tons, distillation 15 tons/day.

## **OTHER FEATURES**

Bilge keels, ship can operate up to Sea State 4.

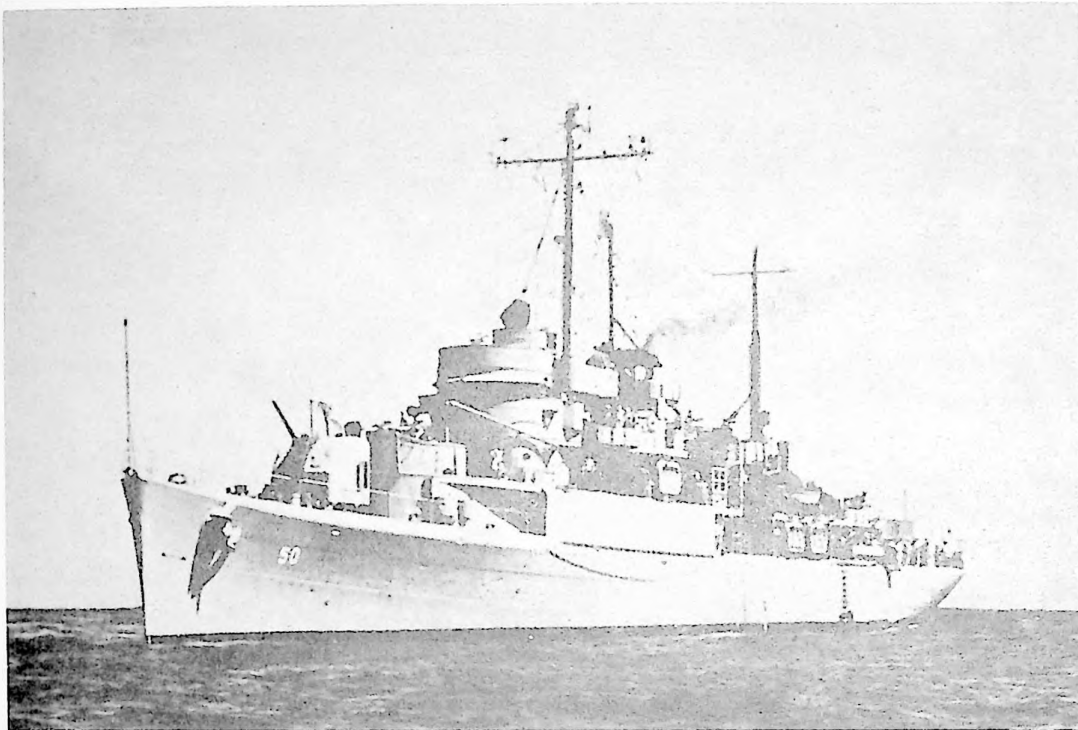
**TYPE OF OBSERVATIONS**

Hydrographic casts, coring, and current surveys.

**REMARKS**

Ship old and requires repairs.

# REHOBOTH



**TYPE:** AGS-50, ex-Seaplane Tender, steel hulled.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1942	310'	41'	14' (aft)	2800 tons (full load)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
16	18.2	5		42 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
172	8-10

## **AFFILIATION**

U. S. Navy.

## **PROPULSION**

Diesel engine drives twin fixed-blade propellers, delivers 6,080 HP. Tank capacity 480 cu.m. diesel.

## **ELECTRICAL POWER**

Ship generates 700 KW. Adequate AC available.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass, magnetic compass, sea search radar, loran, and ship log.

Communication - Standard U. S. Navy transmitters and receivers.

Echosounder - Navy UQN-1B with PDR, with variable ping length.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Two BT winches with 3,000' of 3/32" wire each. One deep-sea anchoring winch with 26,000' of 1/2" wire. One Wheeler winch with 30,000' of 5/32" wire. One current meter winch with 2,000' of 0.31" wire (with slip rings).

## **ACOUSTICAL CHARACTERISTICS**

Silent ship services no longer available.

## **LABORATORIES**

Has four laboratories. Wet laboratory for sample analysis, with electrical, salt and fresh water taps, compressed air, and gyro-repeaters. Chemistry laboratory and photo laboratory have electrical, salt and fresh water taps. Electronics laboratory makes contact with all junction boxes aboard ship.

## **HABITABILITY**

Ship can be used in sub-Arctic, temperate, and tropical areas. Has air-conditioning. Salt water showers not normally required. Fresh

water tank capacity 215 tons. Distillation 38 tons/day.

#### OTHER FEATURES

Bilge keels. Ship can operate up to Sea State 5.

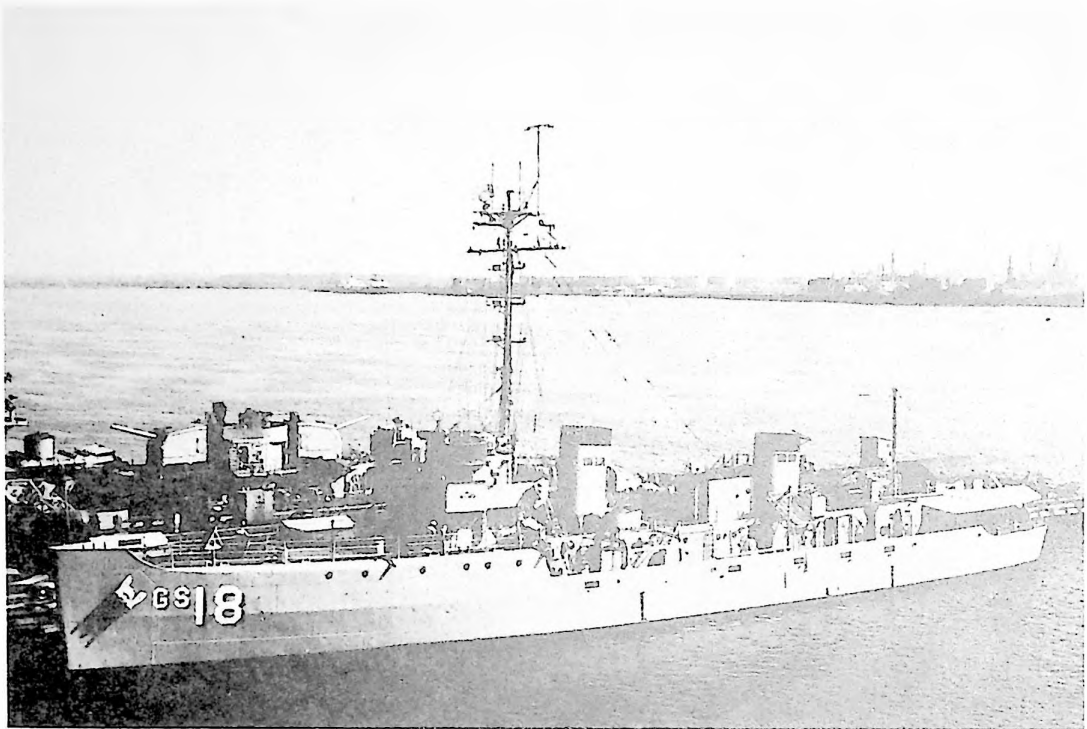
#### TYPE OF OBSERVATIONS

Hydrographic casts, light and heavy coring, hydrography, seismic acoustic, dredging, trawling, and current meter work.

#### REMARKS

Minimum scientific living and working space.

## REQUISITE



**TYPE:** AGS-18, ex-Minesweeper, steel hulled.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1941	220'	32'	10'4" (aft)	1220 tons (full load)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
18				30 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
105	4

## **AFFILIATION**

U. S. Navy.

## **PROPULSION**

Main engine diesel-electric, single fixed-blade propeller, 3,532 HP.  
Fuel tank capacity 250 cu.m.

## **ELECTRICAL POWER**

Ship generates 300 KW. Adequate AC available.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass, magnetic compass, loran, shoran, ship log.

Communication - Standard U. S. Navy transmitters and receivers.

Echosounders - Navy UQN-1B, with variable ping length.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One BT winch with 3,000' of 3/32" wire. One Wheeler winch with 20,000' of 5/32" wire.

## **ACOUSTICAL CHARACTERISTICS**

No facilities for quiet ship.

## **LABORATORIES**

No space available, one small drafting room used for working space.

## **HABITABILITY**

Can be used in temperate and tropical areas, no air-conditioning. Scientific living and working space inadequate. Salt water showers are available but not normally utilized. Fresh water capacity 57 tons, distillation 15 tons/day.

#### **OTHER FEATURES**

Bilge keels, ship can operate up to Sea State 4.

#### **TYPE OF OBSERVATIONS**

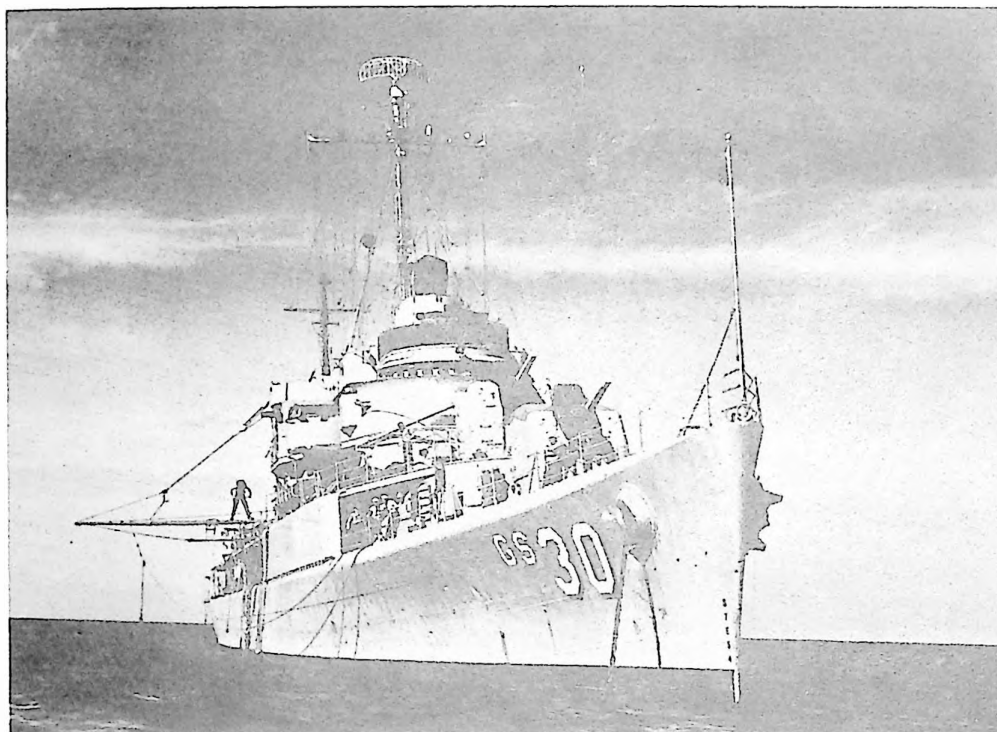
Hydrographic casts, coring, and current surveys.

#### **REMARKS**

Ship is old and needs repair.



# SAN PABLO



**TYPE:** AGS-30, ex-Seaplane Tender, steel hulled.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1942	310'	41'	14' (aft)	2800 tons (full load)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
16	18.2	5		42 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
172	8-10

## **AFFILIATION**

U. S. Navy.

## **PROPULSION**

Diesel engine drives twin propellers (no pitch control) delivers 6080 HP. Tank capacity 480 cu. m. diesel.

## **ELECTRICAL POWER**

Ship generates 700 KW. Adequate AC available.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass, magnetic compass, sea search radar, loran ship log.

Communication - Standard U. S. Navy transmitters and receivers.

Echosounder - Navy UQN-1B with PDR, with variable ping length.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Two BT winches with 3000' of 3/32" wire each. One deep-sea anchoring winch with 26,000' of 1/2" wire. One Wheeler winch with 30,000' of 5/32" wire. One current meter winch with 2,000' of 0.31" wire (with slip rings).

## **ACOUSTICAL CHARACTERISTICS**

Silent ship services no longer available.

## **LABORATORIES**

Has four laboratories. Wet laboratory for sample analysis, with electrical, salt and fresh water taps, compressed air, and gyro-repeaters. Chemistry laboratory and photo laboratory have electrical, salt and fresh water taps. Electronics laboratory makes contact with all junction boxes aboard ship.

## **HABITABILITY**

Ship can be used in sub-Arctic, temperate, and tropic areas. Has air-conditioning. Salt water showers not normally required. Fresh water tank capacity 215 tons. Distillation 38 tons/day.

## **OTHER FEATURES**

Bilge keels. Ship can operate up to Sea State 5.

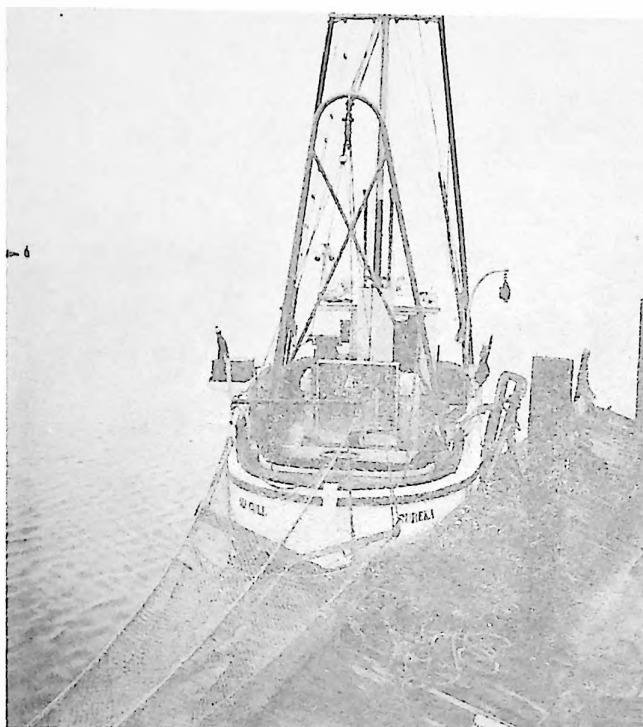
## **TYPE OF OBSERVATIONS**

Hydrographic casts, light and heavy coring, hydrography, seismics, acoustics, dredging, trawling, and current meter work.

## **REMARKS**

Minimum scientific living and working space.

# SEA GULL



**TYPE:** Wooden, Salmon Troller.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1937	39'	11.2'	6'	-	14	9

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
8	9	1		10 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
4 (total)	

## **AFFILIATION**

Chartered by Humboldt State College, Arcata, California.

## **PROPULSION**

Gasoline engines, two 100 HP Kermaths with 2:1 reduction gears. Two fixed-blade propellers. Can carry 300 gal. gasoline.

## **ELECTRICAL POWER**

All equipment operates directly from batteries using DC. Has two 6V generators for engines and one 24V for electronic and scientific equipment.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Has loran, 65W Radio, and depth recorder (Ekolite) which records to 480 fms. and is accurate to nearest fathom.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

No standard hydrographic winch. Two drums fit horizontally on power take-off of 2-ton capacity originally designed for hauling long-line gear, shark nets, crab pots, etc. One drum carries 1,200' of wire and the other 600' of cable. BT casts made on salmon-trolling winches.

## **ACOUSTICAL CHARACTERISTICS**

Can be made noiseless when everything is off.

## **LABORATORIES**

None.

## **HABITABILITY**

Trips generally of one-day duration in a "cold" area. Seven to ten day trips offshore contemplated. Fresh water capacity 80 gal.

## **OTHER FEATURES**

Paravane-type stabilizers operated from two outriggers help to reduce roll.

### TYPE OF OBSERVATIONS

Nearshore oceanography and marine biology. Hydrographic casts, bottom sampling, trolling, trawling, etc.

### REMARKS

Sea-sickness among scientists reported to be a major disadvantage of this vessel.

# SEA QUEST



**TYPE:** Converted steel hulled Albacore Troller (PUGET SOUND)

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1961 (remodeled)	48.8' (overall)	12.4'	6'8" (full)	48 tons		6.0 tons

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
8	10		5,000 miles	

## COMPLEMENT

CREW	SCIENTIFIC STAFF
3	3

## **AFFILIATION**

Lockheed Aircraft Co.

## **PROPULSION**

140 HP Buda engine. Fuel oil (diesel) capacity 2,000 gal.

## **ELECTRICAL POWER**

150 amp.-hrs. 32V DC Battery. 37.5 KVA, 110/220, 60-cycle, single-phase (driven by GM-371 on Korfund Mounts).

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Radar AN/SPS-46, loran, sonar DE-121, RDF, celestial autopilot, and standard and flying bridge compasses.

Communication - Transmitter Ray 85X (150W), Receiver HRO, Transceiver ARC-5.

Echosounding gear on board.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Briston (1,200' of 3/32" wire) winch, Air Cargo (2,500 lbs. draw-bar) winch, and Boom (2,000 lbs. capacity).

## **ACOUSTICAL CHARACTERISTICS**

No information; presumably well qualified.

## **LABORATORIES**

Space available.

## **HABITABILITY**

No information; presumably limited to work off coast of California. 400 gal. fresh water capacity.



### OTHER FEATURES

Full controls provided at both pilot house and flying bridge stations.

### TYPE OF OBSERVATIONS

Oceanographic, biological, and meteorological.

### REMARKS

In spite of its small size, is well equipped and has ample available deck and laboratory space and large reserves of auxiliary electrical power.

# SERRANO

NO PHOTO AVAILABLE

TYPE: AGS-24, ex-Fleet Tug.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1947	205'	39'	16-1/2 (aft)	3021 tons (full load)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
14.9				30 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
108	2

## **AFFILIATION**

U. S. Navy

## **PROPULSION**

Diesel-electric, single fixed-blade propeller, 3000 HP. Tank capacity 340 cu. m.

## **ELECTRICAL POWER**

Ship generates 400 KW. Adequate AC available.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass, magnetic compass, sea search radar, loran, shoran, ship log.

Communication - Standard U. S. Navy transmitters and receivers.

Echosounders - U. S. Navy UQN-1B with PDR, with variable ping length.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One BT winch with 3,000' of 3/32" wire. One Wheeler winch with 20,000' of 5/32" wire.

## **ACOUSTICAL CHARACTERISTICS**

Silent ship service not available.

## **LABORATORIES**

A wet laboratory or chemistry laboratory with electrical, salt water, and fresh water taps. Also a drafting room and scientific office.

## **HABITABILITY**

Operates in tropical and temperate areas. Working space air-conditioned. Salt water showers not utilized. Fresh water capacity 72 tons. Distillation rate 15 tons/day.

## **OTHER FEATURES**

Bilge keels.

**TYPE OF OBSERVATIONS**

Hydrographic casts, light coring and dredging, BT's, plankton tows,  
limited current work.

**REMARKS**

Converted in 1960.

# SHELDRAKE

NO PHOTO AVAILABLE

**TYPE:** AGS-19, ex-Minesweeper, steel hulled.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1941	220'	32'	10'4" (aft)	1220 tons (full load)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
18				30 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
105	4

## **AFFILIATION**

U. S. Navy.

## **PROPULSION**

Main engine diesel-electric, single fixed-blade propeller, 3,532 HP.  
Fuel tank capacity 250 cu. m.

## **ELECTRICAL POWER**

Ship generates 300 KW. Adequate AC available.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass, magnetic compass, loran, shoran, ship log.

Communication - Standard U. S. Navy transmitters and receivers.

Echosounders - Navy UQN-1B, with variable ping length.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One BT winch with 3,000' of 3/32" wire. One Wheeler winch with 20,000' of 5/32" wire.

## **ACOUSTICAL CHARACTERISTICS**

No facilities for quiet.ship.

## **LABORATORIES**

No space available, one small drafting room used for working space.

## **HABITABILITY**

Can be used in temperate and tropical areas, no air-conditioning. Scientific living and working space inadequate. Salt water showers available but not normally utilized. Fresh water capacity 57 tons, distillation 15 tons/day.

## **OTHER FEATURES**

Bilge keels, ship can operate up to Sea State 4.

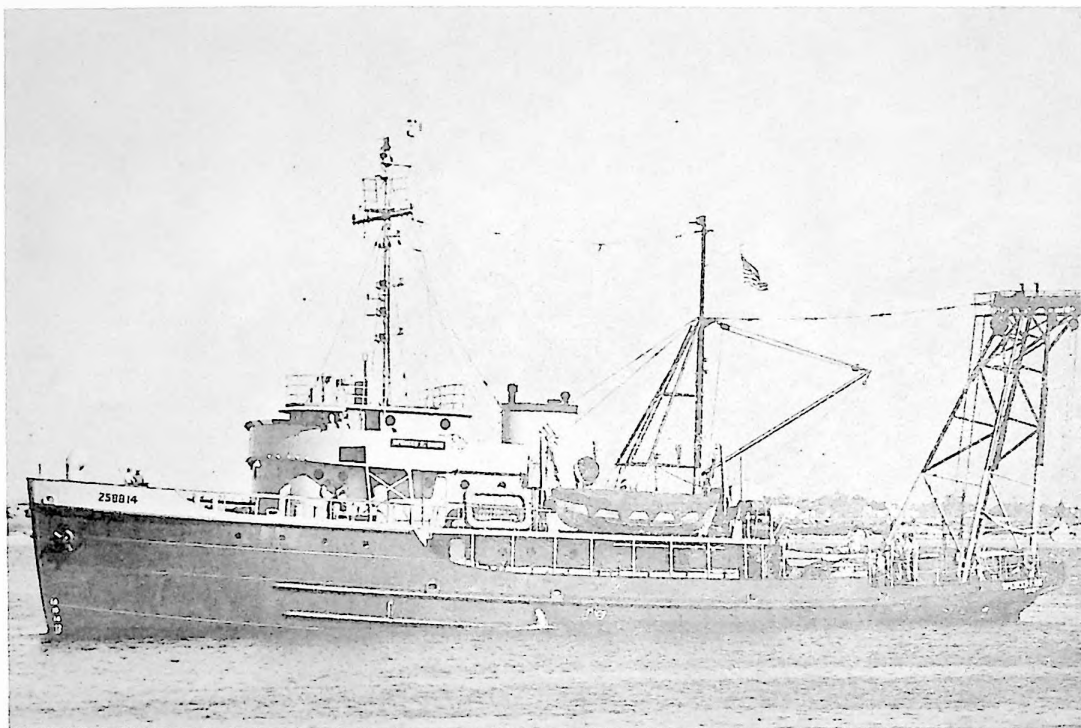
**TYPE OF OBSERVATIONS**

Hydrographic casts, coring, and current surveys.

**REMARKS**

Ship old and requires repairs.

# SPENCER F. BAIRD



**TYPE:** Ex-Army Sea-Going Tug (U. S. Army L. T. 581), steel hulled.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1944	143'	33'	13-1/2'	997 tons	635.8	146.9

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
	12-1/2	0.8	7,000 miles	48 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
18	17



## **AFFILIATION**

Operated by Scripps Institution of Oceanography, University of California.

## **PROPULSION**

Diesel-electric, single fixed-blade screw 1,900 HP. Uses marine diesel fuel, type 2-D, Mobil fuel diesel or equivalent. Tank capacity 53,000 gal.

## **ELECTRICAL POWER**

Ship generates 120 KW (two 60 KW diesel generators). Normal ship operation requires 30 KW. 12 KW available for scientific research. Available voltages are 115V DC, 120 KW; 115V AC, 60-cycle, 24 KW; 450V AC 60-cycle, 5 KW. Standby storage batteries for gyrocompass and emergency radio equipment.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Sperry gyrocompass (MK14 with repeaters), master magnetic compass electro magnetic log, SPS-5 and SU radar, loran (MK2 Model 2-A).

Communication - Transmitters, ART, TBL-7, TCS-12, Viking, TCP-3, and lifeboat transmitter. Maximum range 500 miles daytime and 3,000 miles at night. Receivers - RBB, RBC, TCS-1, two RAO-7, and RBM.

Echosounders - NJ-7 (Submarine Signal Co.) to 200 fms., both visual and audio. EDO Model 185, indicates depths visually on cathode-ray tube (0-100 ft. and 0-100 fms.) or records on chart paper using depth scales of 0-600', 0-600 fms. and 0-6,000 fms. PDR (MK V) used to supplant EDO. With these two working in conjunction, estimated accuracy about 1 part in 3,000.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Two hydrographic winches (Markey) with 25,000' of 3/16" wire on each drum. One dredge winch with 35,000' of 3/4" to 3/8" tapered wire; auxiliary storage drum has 25,000' of 1/2" wire. One BT winch with drum capacity of 1,500' of 1/8" wire or 2,000' of 3/32" wire, has SIO-designed level wind.

## **ACOUSTICAL CHARACTERISTICS**

Not equipped for quiet ship operation. May operate "quiet" for a few hours using kerosene or battery-operated lanterns. Gyrocompass may operate on standby storage battery up to 12 hrs. In seismic dual ship operations this ship generally used as listening ship with one auxiliary generator in use for lighting, minimum motor operation, and scientific instruments.

## **LABORATORIES**

Has 1,108 sq. ft. of laboratory area with salt water, fresh water, and electrical taps.

## **HABITABILITY**

Has worked in tropics, is fairly well ventilated, both mechanically and naturally, and heated. Carries 18,000 gal. fresh water, no distillation facilities, salt water showers available.

## **OTHER FEATURES**

With rolling keels ship operates in rougher seas at 15% reduced speed for each number in excess of 5 on Beaufort scale.

## **TYPE OF OBSERVATIONS**

Hydrographic casts, net tows, phyto plankton tows, bottom sampling, coring, dredging, GEK, and underway observations.

## **REMARKS**

Has large "A" Frame on stern for heavy coring, dredging, and over-the-side work. May accommodate two women for protracted periods. Ship has ammunition carrying capacity for seismic work.

Named after Spencer Fullerton Baird, Naturalist and the Father of the Fish Commission, the first government agency on fish conservation in the United States.

# STATEN ISLAND

NO PHOTO AVAILABLE

TYPE: AGB-5, Icebreaker, steel hulled.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1944	269'	63'	29' (aft)	6500 tons (full load)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
14	16	2	11,000 miles	120 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
234	up to 20

## **AFFILIATION**

U. S. Navy

## **PROPULSION**

Diesel-electric direct drive propulsion plant, made up of six diesel engines capable of producing 5,000 HP for each of twin fixed-blade screws. Fuel tank capacity 2,650 cu. m.

## **ELECTRICAL POWER**

Ship generates 1,250 KW. Adequate AC available.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass, magnetic compass, sea search radar, loran, ship log.

Communication - Standard U. S. Navy transmitters and receivers.

Echosounders - Navy UQN-1C with variable ping length.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One BT winch with 3,000' of 3/32" wire. One Wheeler or Lakeshore winch with 20,000' of 5/32" wire.

## **ACOUSTICAL CHARACTERISTICS**

Quiet ship services not available.

## **LABORATORIES**

Wet laboratory with electrical, fresh, and salt water taps. Aerology laboratory.

## **HABITABILITY**

Tropical work not advisable. Salt water showers not normally utilized. Fresh water capacity 215 tons. Distillation 38 tons/day. Can carry dry provisions for over 300 days of steaming and frozen meats and foods for over 200 days at sea.

## **OTHER FEATURES**

Can break ice up to 20' thick. Equipped with two helicopters. Has two LCVP's on board. Has antirolling-roll tanks. Can perform scientific investigations in seas up to Sea State 3.

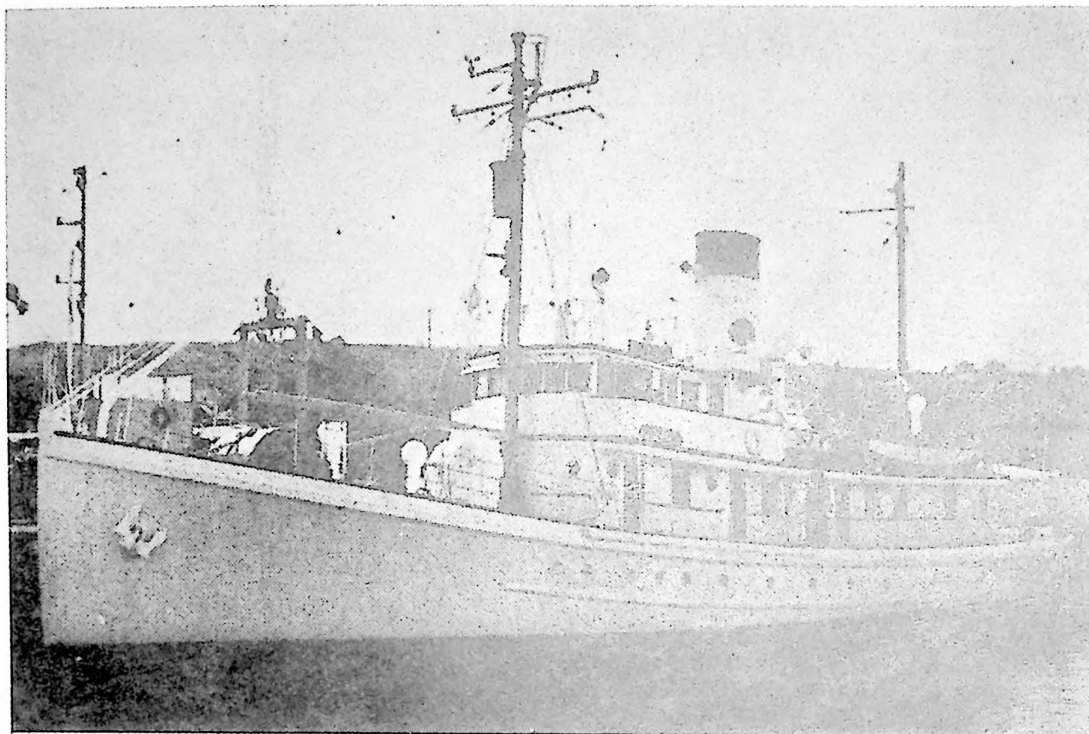
## **TYPE OF OBSERVATIONS**

Hydrographic casts, light coring and dredging, plankton tows, BT's and continuous temperature recordings. Primary mission ice breaking but generally always has scientific complement on board.

## **REMARKS**

Open sea operations not advisable.

# STRANGER



**TYPE:** Wooden hulled Yacht, Refitted by SIO in 1955 for research.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1938	134'	23'11"	13'8"	405 tons (full)	297.7	202

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
12	13	3	6,000 miles	40 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
14	10

## **AFFILIATION**

Scripps Institution of Oceanography, University of California.

## **PROPULSION**

Diesel, direct reversing, twin fixed-blade screws, 800 HP. Uses Type 2-D Mobil fuel diesel or equivalent. Fuel capacity 16,810 gal.

## **ELECTRICAL POWER**

Ship has two 30 KW, 115V DC auxiliary diesel generators. Normal ship operation requires 25 KW 115V DC. Available for research, 35 KW 115V DC and 7-1/2 KVA, 115V AC, 60-cycle, single phase. No battery power available.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass, magnetic compass, SO-1 radar, and loran DAS.

Communication - Transmitters: TBL-7, TCS-12, Viking, TCP-3, and life-boat transmitter. With these can transmit up to 500 miles daytime and 3,000 miles at night. Receivers: RBB, RBC, TCS-1, two RAO-7, RBM and Hallicrafter.

Echosounders - NJ-7 fathometer (0 to 300 fms.), EDO model 185 (scales 0-600 ft., 0-600 fms., 0-6,000 fms. for recording, and 0-100 ft. or 0-100 fms. may be observed on cathode-ray tube indicator). Pulse length changes with scale. PDR is installed when required to supplant the EDO.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One dredge winch (mfg. by Stephen Adams) with 25,000' of 3/8" wire. One hydrographic winch (Markey, model DES-3) with 25,000' of 3/16" wire. Ship will accommodate GEK or BT winches as needed.

## **ACOUSTICAL CHARACTERISTICS**

Not equipped for quiet ship operation, but has been used as "listening ship" for seismic work with good results. May operate for a few hours "quiet" using kerosene or battery lanterns. Gyrocompass can be operated on standby storage battery up to 12 hrs.

## **LABORATORIES**

Ship has two laboratories. Dry laboratory (174 sq.ft.) air-conditioned and has fresh and salt water taps and electrical (115V DC and 115V AC,

60-cycle) batteries. Wet laboratory (80 sq.ft.) with fresh and salt water taps.

#### **HABITABILITY**

Fitted with hot water heating system. Messroom and dry laboratory air-conditioned. Ship prepared for either tropical or cold weather operation. Fresh water capacity 5,990 gal., no distillation apparatus, no salt water showers. Endurance 40 days based on provisions and water but only 17 days based on continuous cruising at 12 knots with 15% reserve fuel on board.

#### **OTHER FEATURES**

Fitted with a 24 cu.ft. portable chest-type reefer for scientific use. Rolling keels are fitted at the turn of the bilge through the midship area. Ship can operate in rough seas at 15% reduction in speed for each number on Beaufort scale in excess of 5.

#### **TYPE OF OBSERVATIONS**

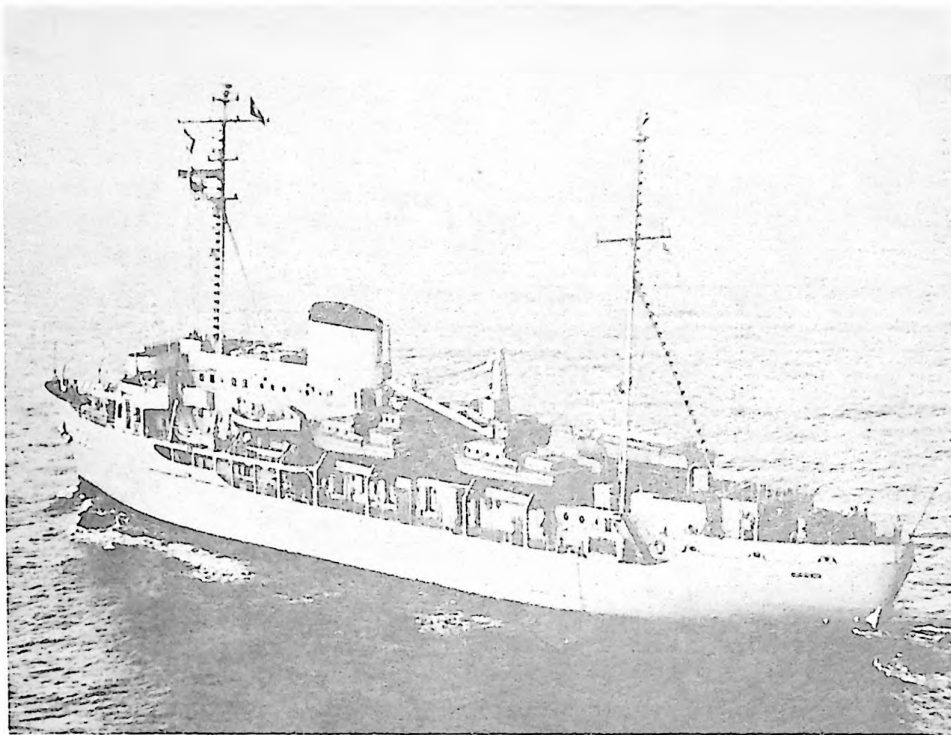
Hydrographic casts, net tows, phytoplankton tows, bottom sampling, coring, dredging, and GEK observations. Occasionally used as a firing ship for seismic operations, but can only carry portable ready service explosives.

#### **REMARKS**

Ship is known as a "double ender" because stern narrows quite perceptibly and stern working area is limited. Stern fitted with a frame which carries sheave for use with dredge winch. Accommodations for women may be arranged.



# SURVEYOR



**TYPE:** Specially built Hydrographic Survey Ship, twin masted, steel hulled.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1960	292.3'	46'	16' (mean)	3,150 tons (full)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
15	16.4	1.5	10,500 miles	100 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
111	total

## **AFFILIATION**

Newest and most modern of Survey Ships belonging to U. S. Coast and Geodetic Survey.

## **PROPULSION**

Main engine is De Laval steam turbine. High and low pressure turbines capable of 5,520 HP. Turbines equipped with double helical and double reduction gears. A Murray and Tregutha "Harbormaster" outboard will be installed for positive directional steering at very low speeds. Fuel oil capacity 730 tons, diesel oil capacity 30 tons. Normally uses Navy SPECIAL Fuel oil (Standard); may substitute Bunker "C" commercial grade. Diesel fuel oil may be used in emergency.

## **ELECTRICAL POWER**

Ship generates 800 KW. Normal ship operation requires 300 KW. Four-hundred KW available for scientific work. Ship's service power: 450V AC, 60-cycle, 3-phase; 115V AC, 60-cycle, single-phase; 115V, 60-cycle, controlled frequency; 4,000V amps., 400-cycle, single-phase; 115V AC; 28V AC; 28V DC, 50 amp., 0-32V DC. (rectifiers).

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Magnetic compass, auto-pilot, main ship radar (Sperry MK III). Gyrocompass, loran receiver, dead reckoning analyzer, RDF, auxiliary ship radar (Bendix), electromagnetic log, EPI for off-shore work to 400 miles (DM 100W), raydist to 175 miles, loran-C (to be installed), and shoran for inshore charting. Launches carry shoran, transistorized raydist, and single-sideband communication equipment.

Communication - Mackey communication console, single-sideband equipment, Collins KWT transmitter, 5LJ4 receiver, radio teletypewriter. Intermediate frequency, 250W, high frequency, single sideband 500W and very high frequency 60W, TCS 14W.

Echosounders - Three, shoal water EDO Type 255C; two deep water EDO Type 185 (Navy UQN); two Timefax PDR recorders which operate in conjunction with EDO 185's. Sounding launches equipped with 808-Type echosounders.

EDO Type 255C. Two sounding scales; ft. or fms. Total range of 230 ft. or fms. Four scale ranges of 65 ft. or fms. each. Ten ft. or fms. overlap between scales. Trace resolution of graph plus or minus 0.1 ft. or fms. Stylus run from synchronous motor-tuning fork source gives speed control from 0.05% to 0.001%. Pulse length can be changed, but requires circuit changes.

EDO Type 185 (Navy UQN). Sounding scales: 0-600 ft., 0-600 fms., 0-6,000 fms. Trace resolution on graph; on 600 ft. scale, plus or minus one ft.; on 600 fms. scale, plus or minus one fm.; on 6,000 fms. scale, plus or minus ten fms. Stylus run by synchronous motor. Tuning fork source gives speed control 0.05% to 0.001%. Pulse length changes with scale.

Timefax PDR Recorder. Sounding scale, 400 fms. Trace resolution plus or minus one fm. Sounding at 400-fms. intervals throughout depth range for all depths. Synchronous motor with built-in tuning fork giving speed accuracy of 0.015%. Pulse length can be changed in two steps.

Submarine Signal Company Type 808. Two sounding scales; ft. or fms. Total range of 160 ft. or fms. Four scale ranges of 55 ft. or fms. each. Twenty ft. or fms. overlap between scales. Trace resolution of graph plus or minus 0.1 ft. or fms. Stylus speed governor controlled. Vibrating reed to indicate stylus speed--accuracy about plus or minus 0.2%. Pulse length cannot be changed.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Hydrographic winch is modified standard Navy BT winch, electro-hydraulic, with 5,000' of 3/32" wire rope. Has swing boom located on port wing of bridge. Oceanographic winch has 30,000' of 5/32" wire rope; can pull 12,000 lbs. at 350 ft./sec. "A" Frame boom for winch may be extended or retracted by hydraulic ram operating off winch hydraulic system.

## **ACOUSTICAL CHARACTERISTICS**

Ship cannot be put in noiseless condition.

## **LABORATORIES**

Chart room (540 sq. ft.); radio room (312 sq. ft.); photo laboratory (78 sq. ft.); oceanographic laboratory (88 sq. ft.); print shop (156 sq. ft.); plotting room, field operations and instrument shop (744 sq. ft.). All spaces have electric power and are air-conditioned. Upper air instrumentation not yet installed.

## **HABITABILITY**

Not structurally strengthened for ice navigation. Has adequate insulation, ventilation and air-conditioning, as well as cold storage locker spaces to permit operation for extended periods in tropical waters. Fresh water capacity 70,000 gal., distillation 8,000 gal./day. Salt water showers could be made available.

## OTHER FEATURES

Retractable outboard motor (Murray and Tregurtha) mounted on stern. Large bilge keels (18" x 70"), allows oceanographic observations to be performed up to Sea State 7. Three 36' hydrographic launches, one 36' landing craft, and four 26' motor whaleboats.

## TYPE OF OBSERVATIONS

Continuous bottom profile, BT (0-900 ft.), bottom samples, (snapper, coring, dredging), current observations (Roberts radio meters), Nansen bottle casts, plankton casts, magnetic observations (with towed proton precision magnetometer).

## REMARKS

This new, modern, six-million-dollar ship is one of most elaborately outfitted research ships in the world. Personnel sufficient to operate 3 or 4 launch hydrographic parties, 2 or 3 topographic or triangulation parties, and be engaged in ship hydrography simultaneously. Oceanographic capabilities will be greatly increased with installation of Loran-C and a heavy duty deep-sea anchoring and coring winch (Western Gear Corp.) with capacity for 45,000' of 3/8" to 3/4" tapered wire rope.

# T-441

NO PHOTO AVAILABLE

**TYPE:** Steel hulled, designed and built as a Cargo and Passenger Vessel for the U. S. Army Transportation Corps.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1953	65'7"	17'8"	6'2" (normal)	90.6 tons (full)	76	60

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
10-1/2	11	3	1,830 miles	5 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
9 (total)	

## **AFFILIATION**

Scripps Institution of Oceanography, University of California.

## **PROPULSION**

Diesel, clutch reversing, single fixed-blade propeller, 270 HP.  
Uses Type 2-D Mobil fuel diesel or equivalent. Tank capacity 2,750 gal.

## **ELECTRICAL POWER**

Ship generates 45 KW, 115V DC and 2-1/2 KW, 115V AC. Normal ship operation requires 5 KW, 115V DC. Available for scientific work, 40 KW, 115V DC and 2-1/2 KW, 115V AC 60-cycle. No battery power available for scientific equipment.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Magnetic compass, fathometer NJ-9.

Communication - TCS-0 transmitter, 1,500-12,000 KC and TCS-9 receiver, 1,500-12,000 KC.

Echosounder - NJ-9 Fathometer (0 to 400 fms.).

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One hydrographic winch (Markey) with 15,000' of 3/16" wire.

## **ACOUSTICAL CHARACTERISTICS**

Ship may be "quiet" for 12 hrs. by using kerosene lanterns for lighting.

## **OTHER FEATURES**

One laboratory (65 sq. ft.) with fresh and salt water taps and electrical outlets.

## **LABORATORIES**

Fitted with hot water heating system, limited ventilation, no air-conditioning. Ship is comfortable in temperate climate. Fresh water capacity 720 gal., no distillation apparatus or salt water showers. Water adequate for 9 persons for 5 days.

## **HABITABILITY**

Fitted with two transducer wells in forward hold which are accessible for change of transducers from within ship. No antirolling devices, ship operates in rougher seas at 15% reduction in speed for each Beaufort unit in excess of 4.

## **TYPE OF OBSERVATIONS**

Hydrographic casts, bottom sampling, light coring and dredging, net tows, GEK and other underway observations.

## **REMARKS**

Ship is used for local work not to exceed five days' duration. Converted in 1955 for oceanographic research by SIO.

# TAGE



**TYPE:** Wooden hulled Cabin Deck Launch. Originally built as a Public Health Service Quarantine Boat.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1934	40-1/2'	11'	4'			

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
	10	2		1-2 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
1	up to 8



## **AFFILIATION**

Hopkins Marine Station, Stanford University, Pacific Grove, California.

## **PROPULSION**

Gray marine diesel, single fixed-blade propeller, 185 HP. Uses auto diesel fuel.

## **ELECTRICAL POWER**

Ship generator used only to recharge batteries which are 12V DC.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Magnetic compass, Karr radio direction finder.

Communications - Karr radio-telephone.

Echosounder - Bendix fathometer, 100 fms.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Single winch used for all work, anchor winch (Northern Line Anchor Winch Model 1222). Operated by power take-off from Gray diesel. Has 1,300 m. of steel wire rope.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

None.

## **HABITABILITY**

Can sleep 3 to 4 on deck. Used only for inshore work. Fresh water carried in jug.

## **OTHER FEATURES**

None.

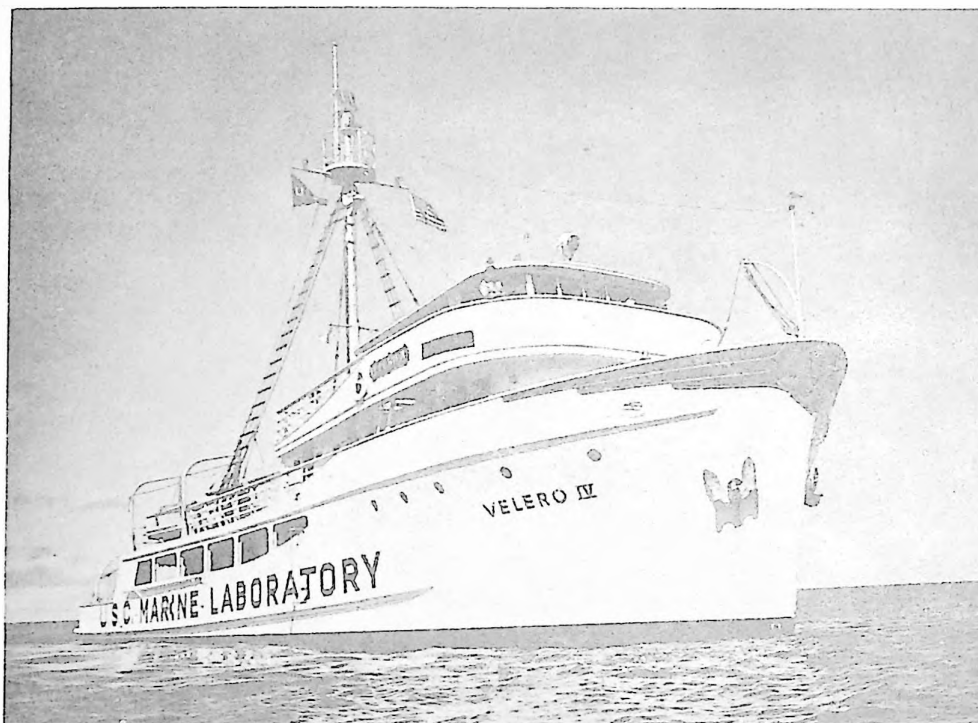
### TYPE OF OBSERVATIONS

Hydrographic casts, plankton hauls down to 800 m., light dredging, midwater trawling.

### REMARKS

Vessel used in weekly cruise on Monterey Bay, and to collect research material for biological studies. Modified for oceanographic work in 1958. Named after Professor Tage Skogsberg, who conducted hydrobiological studies at the marine station.

# VELERO IV



**TYPE:** Hull is San Diego type live bait Tuna Clipper design, steel.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1948	110'	27'7"	13.5' (full)	580 tons (full)	292	198

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
9	10	4		30 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
11	7

## AFFILIATION

Operated by the Allen Hancock Foundation, University of Southern California.

## PROPULSION

Direct drive by 600 HP, six cylinder Atlas Imperial diesel engine. Five-bladed star propeller with fixed pitch. Uses diesel fuel. Carries 26,344 gal. of diesel and 1,050 gal. of lubricating oil. Also carries 500 gal. of gasoline for launch and outboard motors. Main engine uses 21 gal./hr. at cruising speed.

## ELECTRICAL POWER

Total of 145 KW generated from two 50 KW, one 20 KW, and one 25 KW generators. In addition batteries with 1,085 amp.-hrs. capacity, 115V DC, available. Ship requires about 50 KW for normal operations. About 25 KW available for scientific work. Large variety of electrical power available: 120V DC, 145 KW; 12, 24, and 36V DC up to 15 amps; 440V AC; 220V AC; 110V AC; and 115V AC, 60-cycle, 7.5 KW. Some of the electronic gear have own DC-AC generators.

## NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT

Navigation - Sperry gyrocompass (Mark 14) with six repeaters and Sperry Automatic Electric Steering. Two bridge pelori, course recorder and steering column all have repeaters. Kelvin-White magnetic compass. Walker Trident electric ship log. Sperry Mark II and Sperry III radar. Automatic Bendix Marine RDF.

Communication - Radio-telephone (Raytheon Ray 80) HF transmitter and receiver, 2,000 to 25,000 KC. Modified RCA-TCR transmitter, 2,000 to 25,000 KC. Hallicrafter Mod. 42 SX; three Hallicrafter Mod. S-38B and U. S. Army Signal Corps receivers. Three portable F. M. walkie-talkie radio-telephone sets. Has telephone intercom system throughout ship.

Echosounders - EDO Mod. 185, AN/UQN-1C. Flashing light records to 100 ft. and 100 fms.; continuous fathogram records on 600 ft., 600 fms., or 6,000 fms. The 600 fms. scale has been fitted with second keying device to record 600 to 1,200 fms. This unit also operates with PDR on 0 to 200 fms. scale. Also has Submarine Signal Co. N.M.C.-2 which produces audible sonar returns, flashes depths, and records fathograms on 400 and 800 fms. and 2,000 and 4,000 fms. scales. Also operates with PDR. For shallow water uses Raytheon Angler, Mod. D-E 708 portable sounder, reading to 100 ft. on flashing scale. The two deep echosounders record on Times Facsimile Corp. PDR Mod. L.G.O. Mark V.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Heavy winch (Bennet Machine Co.) on main deck with capacity of 14,000' of 7/16" wire, driven by four-speed electric motor; U. S. Navy hydraulic hydrographic winch, powered by 440 AC motor with 21,000' of 5/32" steel wire; U. S. Navy BT winch on port side of boat deck with 1,800' of 5/32" steel wire; and small mechanical hand winch with 400' of 5/32" wire.

## **ACOUSTICAL CHARACTERISTICS**

Unless the DC motors are replaced with AC motors vessel is poor for acoustic work.

## **LABORATORIES**

Two laboratories, 9' x 9' each. One has complete dark room facilities. Laboratories have distilled, fresh and salt water, compressed air, and DC and AC current. Only one laboratory heated.

## **HABITABILITY**

Built for tropical and temperate climate. Not insulated for cold waters and heating facilities inadequate for polar areas. Carries about 18,000 gal. of fresh water but this capacity could be doubled with minor modifications. No salt water showers or distillation apparatus on board.

## **OTHER FEATURES**

Has bilge keels. Can make observations up to Sea State 4. Has large freezer and refrigerator, and well-equipped machine shop. Has launch and several outboard motor boats.

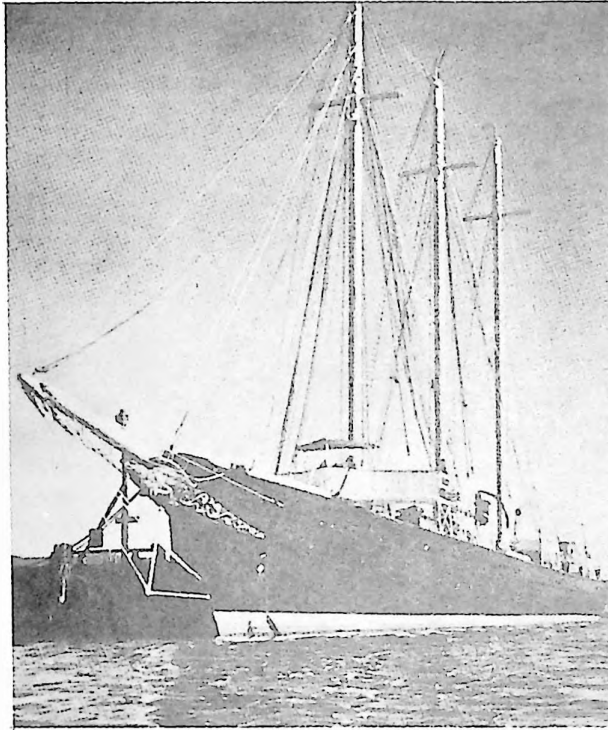
## **TYPE OF OBSERVATIONS**

Continuous depth recording, hydrographic casts, bottom samples (snappers, cores, grabs, etc.), dredging, trawling, bottom photography, weather balloon tracking on radar, and BT's.

## **REMARKS**

Equipped with many small, portable recording instruments. Facilities for two women scientists available.

# VEMA



**TYPE:** Iron hull, Sailboat.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
	202'	33'	17'	743 tons		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
8-10	8 (powered)	0 (with sails)	6000 miles	30 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
19	17

## **AFFILIATION**

Lamont Geological Observatory, Palisades, New York (Columbia University).

## **PROPULSION**

Diesel (Burmeister, Wain-solid injection), single screw, controllable pitch. Diesel Medium No. 210 used, fuel capacity 67 tons. Sails available.

## **ELECTRICAL POWER**

Has 115V AC, 60-cycle, 15 KW and 115V DC, 110 KW. The AC generators are driven by DC motors. Batteries - 400 amp.-hrs. 115V.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Loran, radar, and radio direction finder.

Communication - For scientific use: one RCA Model TCP-2 transmitter and receiver, 2-3 MC, 75W, phone only. One TCS-13 transmitter and receiver, 2-12 MC, 20W, phone and CW. One Collins KWM-1 transceiver, amateur bands only, 100W, SSB. Has additional radio equipment on board for ship's business.

Echosounders - Two AN/UQN-1B used with precision depth recorder Mark V-12. Two Raytheon DE-122 200 KC and one Raytheon DE-119 40 KC. Timing accuracy controlled by tuning fork oscillator to one part per million.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One hydrographic winch with 4,200 fms. of 1/64" wire. One BT winch with 2,000' of 3/32" wire. One coring winch with 5,500 fms. of 1/2" cable.

## **ACOUSTICAL CHARACTERISTICS**

Very good for acoustical work at sea.

## **LABORATORIES**

Two laboratories: wet and after laboratories. Wet laboratory used for chemical, biological, and sediment analysis; has sink, refrigerator, electrical and water taps. After laboratory contains electronic

equipment (seismic, gravity, and sounding equipment).

#### **HABITABILITY**

No special facilities but vessel has been operating in cold and tropical regions. Fresh water capacity 52 tons, no distillation equipment. Salt water showers available.

#### **OTHER FEATURES**

No other special features.

#### **TYPE OF OBSERVATIONS**

Hydrographic casts, coring, dredging, trawling, BT's, magnetic gravity, and continuous temperature observations.

#### **REMARKS**

Ship can occupy ocean stations or perform other research activities up to Sea State 5 or 6.



# WESTWIND

NO PHOTO AVAILABLE

**TYPE:** WAGB-281, Icebreaker, steel hulled.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1943	269'	63'	29' (aft)	6500 tons (full load)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
14	16	2	11,000 miles	120 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
234	up to 20

## **AFFILIATION**

U. S. Coast Guard.

## **PROPULSION**

Diesel-electric direct drive propulsion plant, made up of six diesel engines capable of producing 5,000 HP for each of twin fixed-blade screws. Fuel capacity 2,650 cu. m.

## **ELECTRICAL POWER**

Ship generates 1,250 KW. Adequate AC available.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass, magnetic compass, sea search radar, loran, ship log.

Communication - Standard U. S. Navy transmitters and receivers.

Echosounders - Navy UQN-1C, with variable ping length.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One BT winch with 3,000' of 3/32" wire. One Wheeler or Lakeshore winch with 20,000' of 5/32" wire.

## **ACOUSTICAL CHARACTERISTICS**

Quiet ship services not available.

## **LABORATORIES**

Wet laboratory with electrical, fresh and salt water taps. Aerology laboratory.

## **HABITABILITY**

Tropical work not advisable. Salt water showers not normally utilized. Fresh water capacity 215 tons. Distillation 38 tons/day. Can carry dry provisions for over 300 days of steaming and frozen meats and foods for over 200 days at sea.

## OTHER FEATURES

Can break ice up to 20' thick. Equipped with two helicopters. Has two LCVP's on board. Has antirolling-roll tanks. Can perform scientific investigations in seas up to Sea State 3.

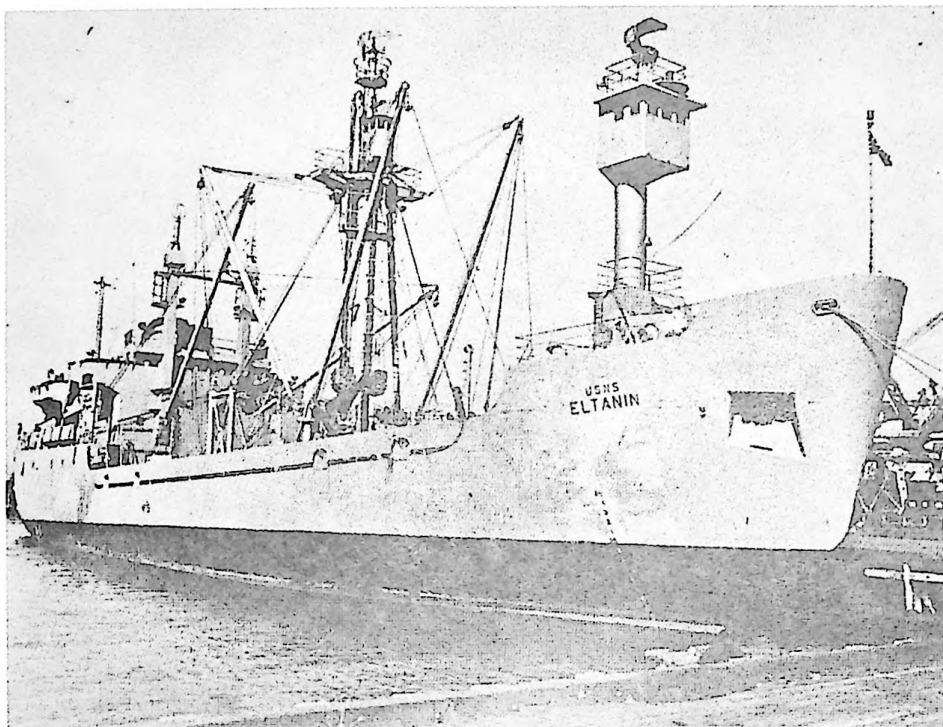
## TYPE OF OBSERVATIONS

Hydrographic casts, light coring and dredging, plankton tows, BT's and continuous temperature recordings. Primary mission ice breaking but generally always has scientific complement on board.

## REMARKS

Open sea operations not advisable.

# ELTANIN



**TYPE:** T-AK 70, Cargo ship, welded steel hull with a raked ice-breaker form bow and a modified cruiser stern.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1957	266'	51'	19 3/4' (full)	3,886 tons full	2,486	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
13			10,000 at 12 kts.	

## COMPLEMENT

CREW	SCIENTIFIC STAFF
47	32

## **AFFILIATION**

Owned by MSTS and operated by them for the National Science Foundation.

## **PROPULSION**

Diesel electric, driving twin 4-bladed screws, 2,700 SHP.

## **ELECTRICAL POWER**

Has sufficient electrical power to perform any research endeavor.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Equipped with the latest navigation, communication and echosounding equipment.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Deep-sea coring winch, BT winches, and others.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Has several laboratories for meteorology, marine biology, electronics, and hydrographic work. Large cosmic ray scintillation counter is installed. Facility for measuring low-and high-frequency radio noise.

## **HABITABILITY**

Ship can operate in all navigable waters. Quarters are comfortable and fresh water supply is sufficient for extended cruises. Double hull feature is extended up to the main deck and other cold weather operation characteristics are built in.

## **OTHER FEATURES**

Bow is cut back to enable her to ride onto ice instead of hitting it, to help her break through, but she is not designed to penetrate heavy pack ice. Has hanger for inflating weather balloons and platform for launching them. Helicopter deck. Special antiroll tanks.

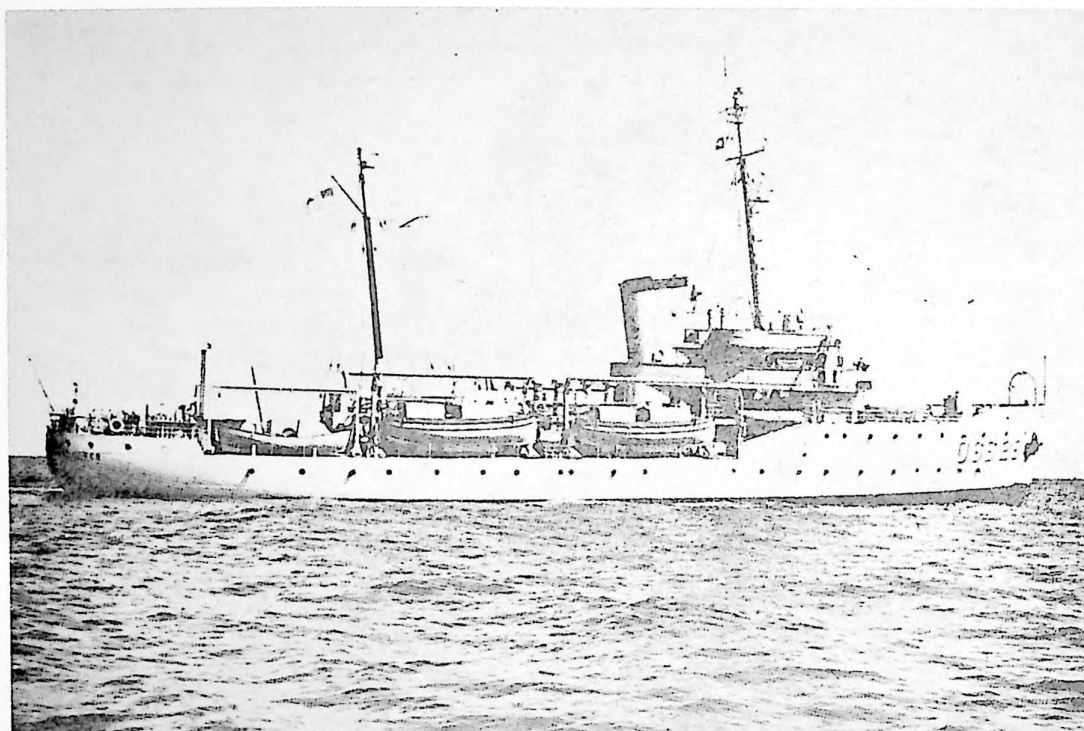
## TYPE OF OBSERVATIONS

Can accommodate numerous disciplines, including physical oceanography, submarine geology, gravity and magnetics, meteorology, upper atmosphere studies and marine and terrestrial biology. Also cosmic ray meson studies and range and variability of radio noise of the ocean areas are investigated.

## REMARKS

Recently converted to serve as floating laboratory for research, particularly in Antarctic waters. Named after a navigational star of the constellation Draco in the far northern sky. Carries numerous scientists on board from government agencies, universities and commercial organizations, each of whom may be involved in a particular research problem.

# EXPLORER



**TYPE:** Steel hulled; designed and built as a Hydrographic Survey Ship.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1940	219.6'	38.0'	15.0' (mean)	1900 tons (full load)		

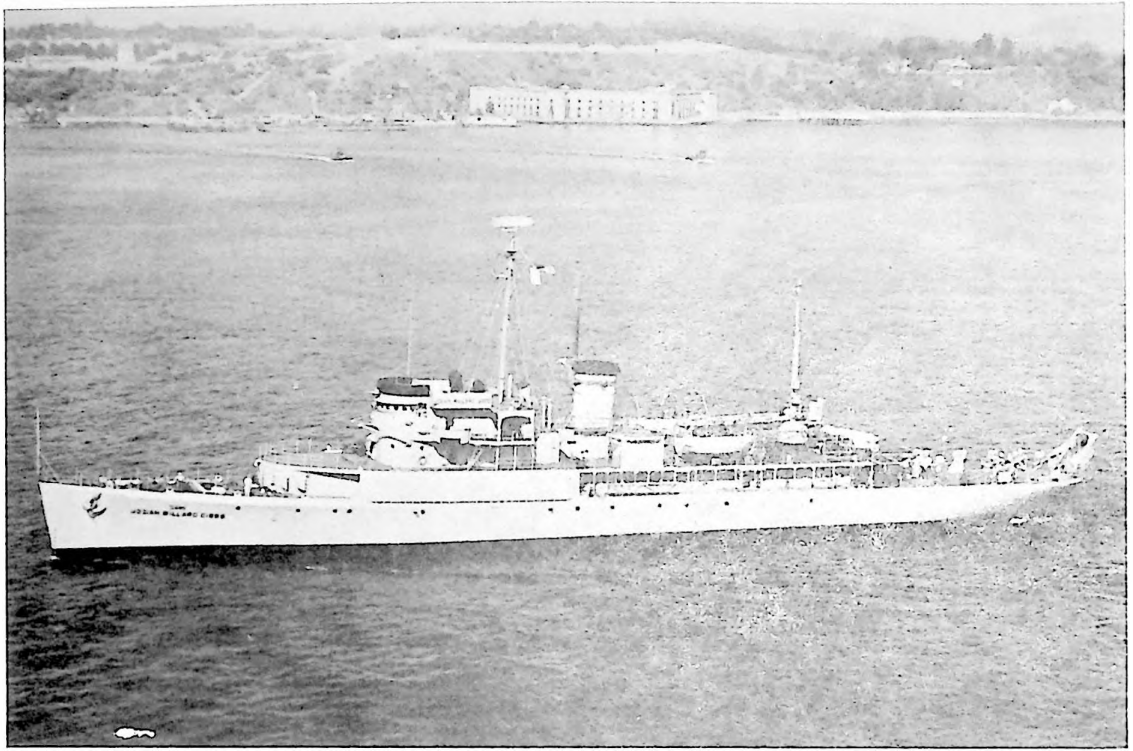
## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
12.5	13.3	3.0	at 12-1/2 kts.3750 miles and 12-1/2 days at 6-1/2 kts.2960 miles and 19 days at 3 kts. 1875 miles and 26 days	

## COMPLEMENT

CREW	SCIENTIFIC STAFF
79	23 (including officers)

# JOSIAH WILLARD GIBBS



**TYPE:** T-AGOR 1, steel hulled, former Small Seaplane Tender (San Carlos AVP-51).

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1944 (commissioned)	311'	42'	14.5' (full)	2,800 tons	2,265	965

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
15	18.5	1.5	7,000 miles (steaming)	4 months

## COMPLEMENT

CREW	SCIENTIFIC STAFF
48	24



## **AFFILIATION**

Owned by the United States Navy. Operated by MSTs for the Hudson Laboratories of Columbia University, 145 Palisade Street, Dobbs Ferry, New York.

## **PROPULSION**

Direct diesel (4 Fairbanks Morse 10 cylinder diesel engines), 6,400 HP, with two non-controllable propellers. Generally uses marine diesel, Navy Standard, 3,200 barrels capacity.

## **ELECTRICAL POWER**

Ship generates 600 KW, 125 KW required for normal operation of ship, and 180 KW available for scientific apparatus and instruments. Characteristics are: 400 KW at 440V 60-cycle and two 35 KW motor generators for DC power.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Sperry Mark III Radar, ranges 1,2,6,15, and 40 miles. Master unit located in wheelhouse with repeater unit in laboratory. Two Sperry AN/SPN7A lorans. One RDF, MacKay type 4004A. One Sperry gyrocompass, with repeaters located on each wing, in wheelhouse, in RDF, in radar, in laboratory, in sonar, in steering engine room, and on deck below after steering. Two magnetic compasses (USN); one pit log; one facsimile recorder, 60 r.p.m. drum; one DRT in laboratory; shaft r.p.m. indicators in wheelhouse and laboratory; one stadimeter.

Communication - One MRU 10-11-13, includes 4 transmitters. One 250W HF, 2 MC - 24 MC with master oscillator and 10 crystals. One 250W LF, 355 KC - 500 KC with master oscillator and 8 crystals. One 40W emergency 355 KC - 500 KC with 5 crystals 12V DC. One 100W transmitter radio-telephone, 2-12 MC, 10 crystals with remote units in wheelhouse and laboratory. Two Collins transmitters, 30 K-1, each 2 crystal channels with remote in laboratory, 2-30 MC. Two receivers, 85 KC - 24 MC. One LF receiver, 15 KC - 650 KC, battery operated if necessary. One emergency receiver, 300 KC - 650 KC, 12V DC operated. One automatic alarm keyer. One TMC GPT 750A transmitter for SSB, CW, and AM 2-30 MC, 10 crystals, up to 1000W. TMC receiver GPR 90 RX, 550 KC - 30 MC, with side band selectors, 10 crystals. One portable lifeboat radio, self-powered, 500 KC CW 5W 8364 KC 1 CW. Three portable radio-telephones, 30W 2-4 MC, 5 crystals. Various receivers in laboratory. One UQC underwater telephone operating on an 8 KC carrier. Internal ship's communications include two sound powered phone systems and one "squawk-box" system.

Echosounders - Two EDO AN/UQN/IC; one in wheelhouse, one in laboratory. Ranges, 0 to 100 ft. on CRT; 0 to 600 ft. on CRT; 0 to 600 ft. on paper; 0 to 600 fms. on paper; 0 to 6,000 fms. on paper. Fathometer in laboratory has Times Fax RJ2 PDR available with automatic or single ping, recording in 400 fms. increments up to 5,200 fms.

## HYDROGRAPHIC WINCHES AND EQUIPMENT

Main oceanographic winch (Western Gear Corporation) 150 HP, 440V, 3-phase motor with drums capable of storing 32,000 ft. and 22,000 ft. of 5/8" wire. Auxiliary winch (Almon A. Johnson Inc.), 40 HP 440V, 3-phase AC motor with drum capacity of 5,000 ft. of 1/2" wire and a second drum having 12,000 ft. of 0.3" wire capacity. Hydrographic winch, (Crocker Wheeler Co.), 15 HP, 440V, 3-phase motor, with 30,000 ft. of 5/32" wire capacity. BT winch, Davit winch, stores several thousand ft. of 1/4" wire rope. Warping winch with two gypsy heads, rated about 30,000 lbs. pull at slow speeds. Bomb disposal winch, with 5,000 ft. of 1/4" capacity drum mounted on one of the gypsy heads. Ship's boom rated at 20,000 lbs. working load, and a number of miscellaneous fairleads and portable winches.

## ACOUSTICAL CHARACTERISTICS

Two quieted conditions may be distinguished. The first, referred to as "quiet ship" involves the operation of main generators and hotel load without the operation of propulsion machinery. This is generally quiet enough for many sound reception purposes not involving levels as low as the ambient noise. The second, referred to as "silent ship" has two 25 KW shock-mounted diesel generators operating in a sound-isolated compartment on the boat deck. In this condition presence of ship cannot be determined with a hydrophone at 500 ft. "Silent ship" may be maintained up to 18 hours.

## LABORATORIES

Laboratory A (500 sq. ft.); laboratory B (185 sq. ft.); radio and navigational laboratory (240 sq. ft.); scientists data laboratory (216 sq. ft.) scientists office (120 sq. ft.); mechanical engineering laboratory (250 sq. ft.) with compressed air and arc welder; dark room (62 sq. ft.); machine shop with lathe, drill press, and compressed air. All laboratory space air-conditioned with 110V AC regulated power, one phase or 3-phase, with approximately 10 amps. of 6V, 12V, or 24V DC.

## **HABITABILITY**

Carries 110 tons fresh water with 20 tons reserve. Distillation capacity 30 tons/day. Ship can work both at the poles and in the tropics.

## **OTHER FEATURES**

No anti-rolling devices except for rolling chocks. Ship can be anchored at any depth and remain anchored in wind and sea up to 55 knots.

## **TYPE OF OBSERVATIONS**

Designed for maximum flexibility in physics experiments at sea. Can accommodate large quantities of electronics and fairly elaborate mechanical devices over the side, and is competent to undertake the operation of all normal oceanographic disciplines if equipment is available. Especially adapted for acoustical work, particularly listening with elaborate arrangements of hydrophones.

## **REMARKS**

Names for Professor Josiah Willard Gibbs (1839-1903) generally considered America's greatest theoretical physicist. Vessel extremely comfortable and demonstrates the value of a large ship in marine scientific work; both because of her endurance, large equipment and scientific crew capacity, and her ability to work under more difficult conditions of wind and sea than are normally possible in marine science. Women scientists may be berthed with prior arrangements.

# LITTLEHALES



**TYPE:** AGSC-15, ex-Yard Freighter, steel hulled.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1945	132'	31'	5'10" (aft)	600 tons (full load)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
9	10	5		14 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
21	no bunking facilities

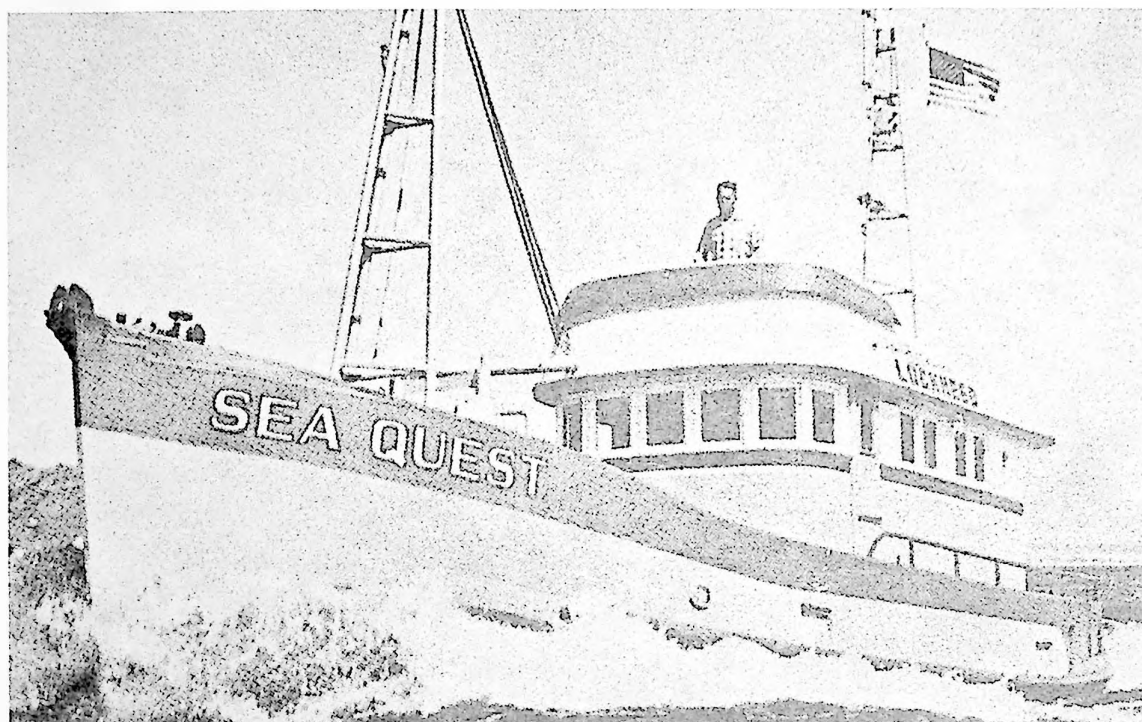
### TYPE OF OBSERVATIONS

Nearshore oceanography and marine biology. Hydrographic casts, bottom sampling, trolling, trawling, etc.

### REMARKS

Sea-sickness among scientists reported to be a major disadvantage of this vessel.

# SEA QUEST



**TYPE:** Converted steel hulled Albacore Troller (PUGET SOUND).

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1961 (remodeled)	48.8' (overall)	12.4'	6'8" (full)	48 tons		6.0

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
8	10	4 (w/o drogue)	5,000 miles	17 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
2	4

## **AFFILIATION**

Lockheed Aircraft Corp., Lockheed California Co.

## **PROPULSION**

Has 140 HP Buda engine. Fuel oil (diesel) capacity 2,000 gal.

## **ELECTRICAL POWER**

Has 150 amp.-hrs. 32V DC battery. 37.5 KVA, 110/220V, 60-cycle, single-phase (driven by GM-371 on Korfund Mounts).

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Radar AN/SPS-46, loran, sonar DE-121, RDF, celestial autopilot, and standard and flying bridge compasses.

Communication - Transmitter Ray 85X (150W), Receiver HRO, Transceiver ARC-5.

Echosounding gear on board.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Bristol winch with 1,200 ft. of 3/32" and 1,000 ft. of 1/8" wire; Air Cargo winch with 2,500 lbs. draw-bar, and Boom capacity, 2,000 lbs. Hytech hydro winch (hydraulic) with 16,500 ft. of Amergraph 4-conductor 3/16" cable. Fitted with physical, biological and geological sampling equipment. Continuous diving air.

## **ACOUSTICAL CHARACTERISTICS**

One KW of special-mounted 110V 60-cycle AC driven from batteries. This is one of the quietest surface ships afloat when running on "silent ship."

## **LABORATORIES**

Space available. Standard racks and shelves.

## **HABITABILITY**

Comfortable quarters for up to two week's work offshore. All electric galley, deep freeze, refrigerator, hot water, heaters and fans, 400 gal. fresh water capacity.

## **OTHER FEATURES**

Full controls provided at both pilot house and flying bridge stations.  
Skiff with outboard.

## **TYPE OF OBSERVATIONS**

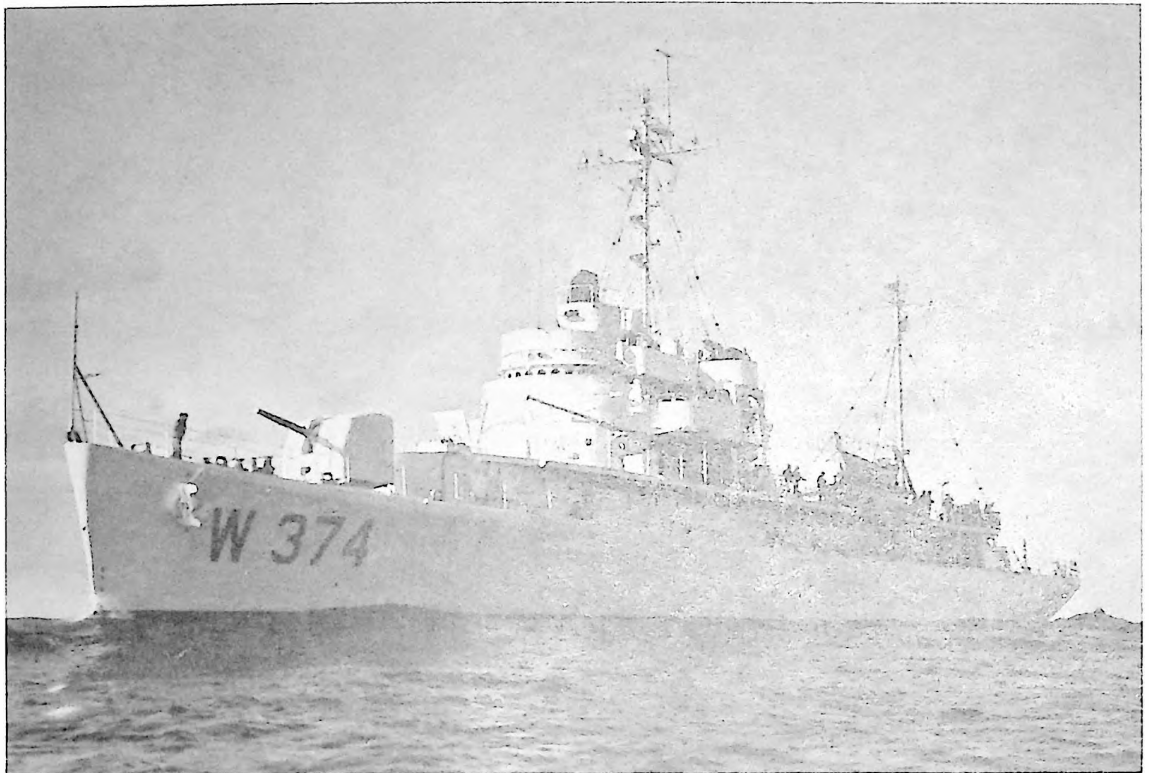
Oceanographic, biological, and meterological.

## **REMARKS**

In spite of its small size, is well equipped and has ample available deck and laboratory space and large reserves of auxiliary electrical power.



# ABSECON



**TYPE:** Coast Guard Cutter, former Seaplane Tender (small), "Casco" class (WAVP-374).

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1942	311'	41'	13 1/2'	2,300 tons (full)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
	18			

## COMPLEMENT

CREW	SCIENTIFIC STAFF
134	4

## **AFFILIATION**

U. S. Coast Guard.

## **PROPULSION**

Gear diesel, twin screw, 6080 BHP.

## **ELECTRICAL POWER**

No information, but probably similar to SAN PABLO and REHOBOTH.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - AN/SPS-29 radar.

Communication - Standard U. S. Coast Guard transmitters and receivers.

Echosounders - AN/UQN sonic depth finders, PDR.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

BT winch and oceanographic winches.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Meteorological laboratory equipped with radiosonde equipment and other meteorological instruments. Chemistry laboratory with salinometer. Balloon inflation shelter.

## **HABITABILITY**

Quarters comfortable for long patrols on ocean weather station.

## **OTHER FEATURES**

No information.

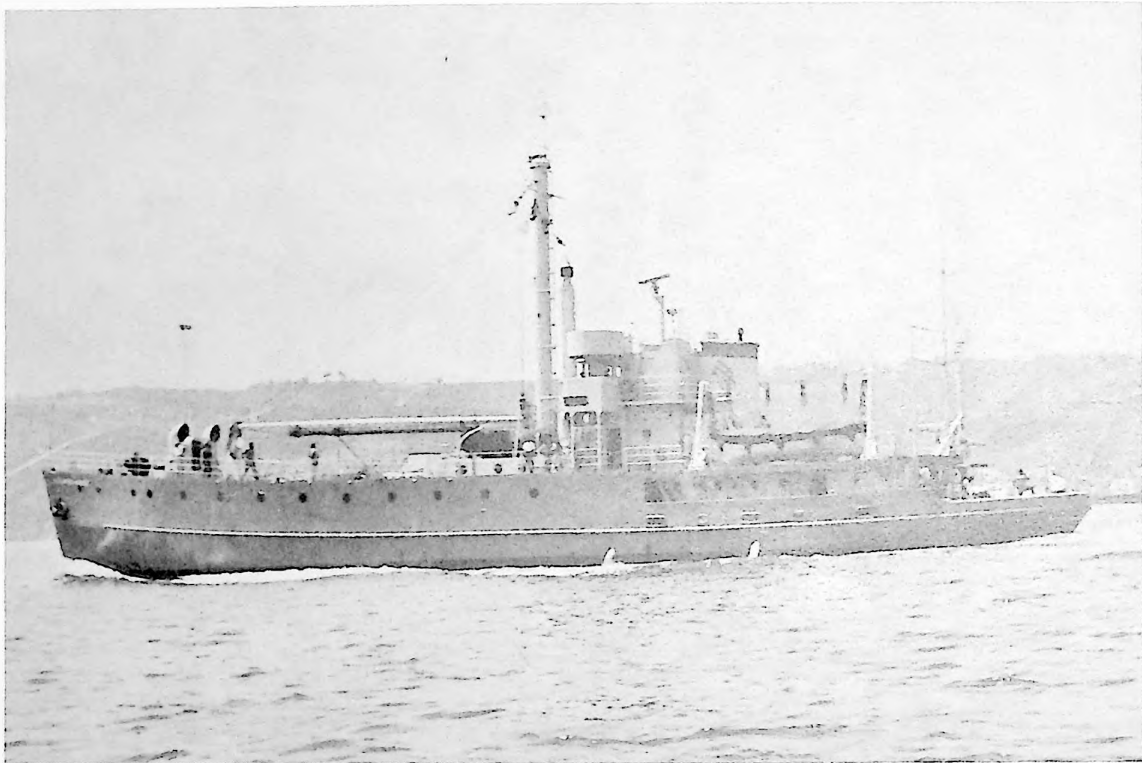
## TYPE OF OBSERVATIONS

Meteorological observations, soundings, sea and swell observations, fish, bird and other wildlife counts, subsurface temperatures, drift bottle releases, plankton samplings, and water and air samplings, BT's (electronic BT's are being installed on all Atlantic ships).

## REMARKS

Patrols ocean weather station, "Charlie", 52°45' N., and 35°30' W. Sister ship's are: CHINCOTEAGUE, BARATARIA, COOK INLET, BERING STRAIT, CASCO, CASTLE ROCK, HUMBOLDT, McCULLOCH, COOS BAY, HALF MOON, ROCKAWAY, YAKUTAT, GRESHAM, MACKINAC, MATAGORDA. All cutters will eventually be equipped to make oceanographic observations.

# ALEXANDER AGASSIZ



**TYPE:** Shallow Draft ocean going freighter. Ex-U. S. Army FS-208.  
Converted for oceanographic research. Steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1944	179'10"		9'6"	820 tons		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
11	12		5,000 miles	20 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
18	13

## **AFFILIATION**

Scripps Institution of Oceanography, University of California.

## **PROPULSION**

Two Diesel engines, reverse reduction, 500 HP each, twin fixed blade propellers. Uses Mobil Type 2-D diesel fuel or equivalent. Tank capacity 32,293 gal.

## **ELECTRICAL POWER**

Ship generators 200 KW (two 100 KW diesel generators), 230/115V DC. Twenty five KVA of 115V, 60-cycle, single phase AC is furnished by motor generators. Standby storage batteries installed for gyro compass and emergency equipment.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Sperry Gyro compass (MK 14 with 6 repeaters); master magnetic compass; Raytheon Depth Recorder; Sperry MK-2, Mod. 2 Loran; Direction Finder, Mackay; Decca Radar Model 838; automatic pilot, Sperry lever type; anemometer - model F-420-c-Electric Speed Indicator Co.

Communication - Three transmitters: Mackay models - 2013BF, and 2010-A with radio telephone and high and low frequency receivers. One Pierce Simpson, Carib model ship to shore transmitter and receiver. One emergency life boat radio mfg. by Mackay.

Echosounder - EDO Model 185 will record depths permanently on paper or indicate them visually on face of cathode ray tube. Pulse length changes with scale, 0-6,000 fms. PDR (MK V) works in conjunction with EDO to give accurate depth to 4,000 fms. with estimated error of about one part in 3,000.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One hydrographic winch (Markey) with 25,000 ft. of 3/16" wire, with 15 HP 230V DC electric motor. One BT winch with drum capacity of 2,000 ft. of 3/32" wire or 1,500 ft. of 1/8" wire.

## **ACOUSTICAL CHARACTERISTICS**

Not equipped for quiet ship operation.

## **LABORATORIES**

Has 110 sq. ft. for dry laboratory and 180 sq. ft. for wet laboratory space. Salt, fresh, and distilled water taps and electrical outlets. Large space for working on bulky equipment out of the weather.

## **HABITABILITY**

Ship is ventilated both naturally and mechanically for reasonable comfort in tropics. Ship also heated by steam when operating in temperate zones in winter. Fresh water capacity is 14,400 gal.

## **OTHER FEATURES**

Ship is equipped with underwater windows on the port side approximately 6 ft. below the waterline.

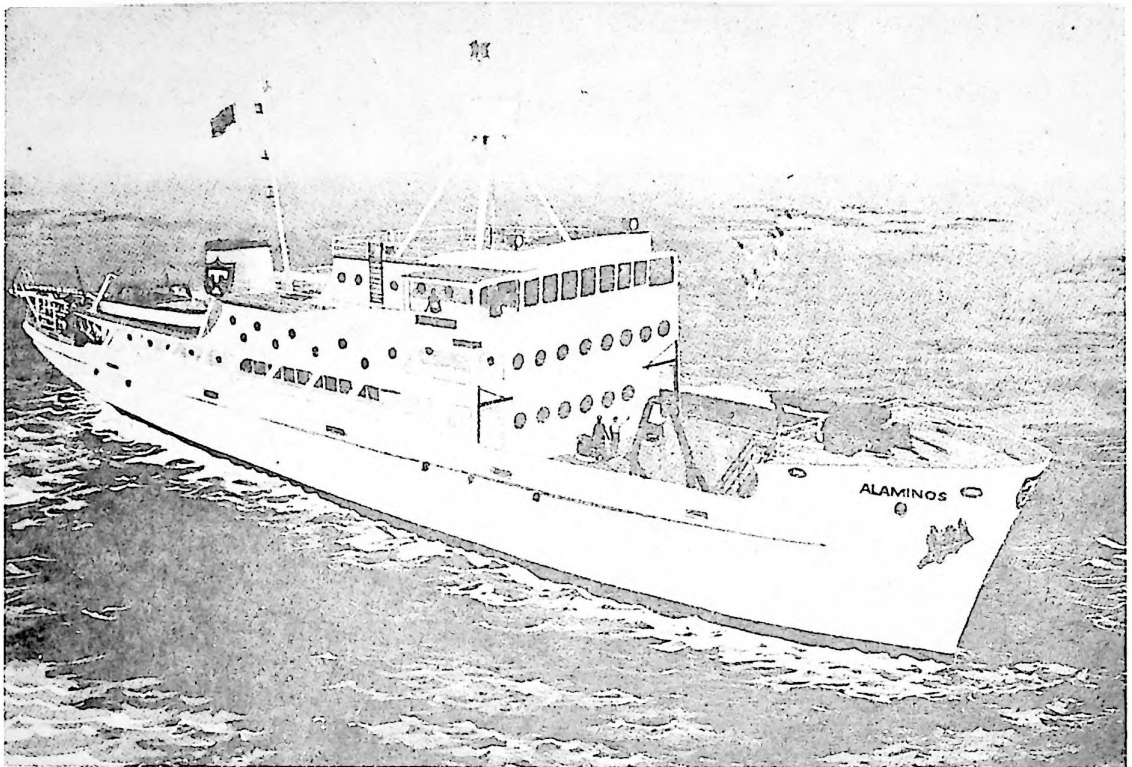
## **TYPE OF OBSERVATIONS**

Hydrographic casts, light coring BT's, plankton tows, and limited current work.

## **REMARKS**

The ship was converted in 1962 for work involving marine life research only. Further conversion for more extensive work is contemplated in the near future.

# ALAMINOS



**TYPE:** Converted to Research Vessel, steel hull. Ex-U.S. Army Supply Ship (FS-227).

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1944-built	179'10"	32'	8'4"	740 tons	770	
1962-converted						

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
12		0-1 1/2	6,000 miles	34 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
18	14

## **AFFILIATION**

Owned by Texas A. and M. Research Foundation and operated by Department of Oceanography and Meteorology.

## **PROPULSION**

Twin GM 6-278-A diesels, 500 HP each at 750 r.p.m. Retractable bow propulsion unit (Murray and Tregurtha) powered by electric motor, capable of 360° rotation, will be used for station keeping and to provide forward speed up to 1 1/2 kts. Also fitted with remote engine, and steering control. Twin fixed-blade propellers. Uses type 2-D Mobil fuel diesel or equivalent.

## **ELECTRICAL POWER**

Two 100 KW 120-240V 3-wire DC generators. Two motor generators of 20 KVA capacity installed to supply 115V 60-cycle AC power for laboratories and ship's electronics. A small 400-cycle source will be installed. Auxiliary 25 KW generator will be converted to electric drive so that shore power can be utilized.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Will be equipped with latest navigational and communication equipment.

Echosounders - At least two echo sounding transducers and one fixed transducer will be on board.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One deep sea dredging and trawling winch with 33,000 ft. of 1/2" wire. Two hydrographic winches each with 33,000 ft. of 5/32" wire. Two BT winches. One hoist for 900 ft. of towed instrumented chain. Austin Western full hydraulic Whirely type crane on forecastle deck with boom extension to 35 ft. and lift of 2,500 lbs. with separate diesel power plant that will service forward working deck. Hydraulically operated "A" frame mounted on starboard rail. Solid plate rail, with freeing ports, runs to within 25 ft. of stern fitted with brackets for core handling. There will be folding hydrographic platforms on each side near forward end of deck house. Normal hydrographic stations with platform and boom will be on port side--but additional installation is provided on starboard side.



## ACOUSTICAL CHARACTERISTICS

Anticipated that ship can operate in semi-quiet condition when necessary.

## LABORATORIES

A total of 2,926 sq. ft. of scientific space is available including laboratories, storage, library, etc. This is in addition to deck space of 2,150 sq. ft. Small laboratory for Carbon-14 sampling located in the forecastle. Under the forecastle deck extension there is a work bench with running water for biological work and a work bench for rough machinery. Welding equipment may be located here. A shaker table with graduated screens for benthic biological samples is mounted. Main deck laboratory provides a cruise office and electronic laboratory and space for general wet laboratory requirements. A lazy Susan type Nansen rack is accessible from the hydro bucket and the wet laboratory. Also includes chemistry bench, work bench, and plotting tables. Starboard is an aquaria complex for live material storage. Gravity laboratory and scientific workshop also available. Main hold divided into a number of special purpose laboratories.

## HABITABILITY

Quarters comfortable and spacious. Fully electric galley. Carries 1,400 gal. potable water. Heat recovery evaporation with 1,500 gal./day capacity is being installed. Also has ion exchange resin beds for ion free water in laboratories.

## OTHER FEATURES

Balloon inflation shelter with convenient helium storage. A 4' X 4' hydraulic elevator serves the lower laboratory area. Passive stability tanks will be installed under lower laboratory area for stability. Reserve fuel oil will be carried in these tanks. Equipment can be lowered below hull through large gate valve and stuffing box assemblies. Two bed hospital located in after hold.

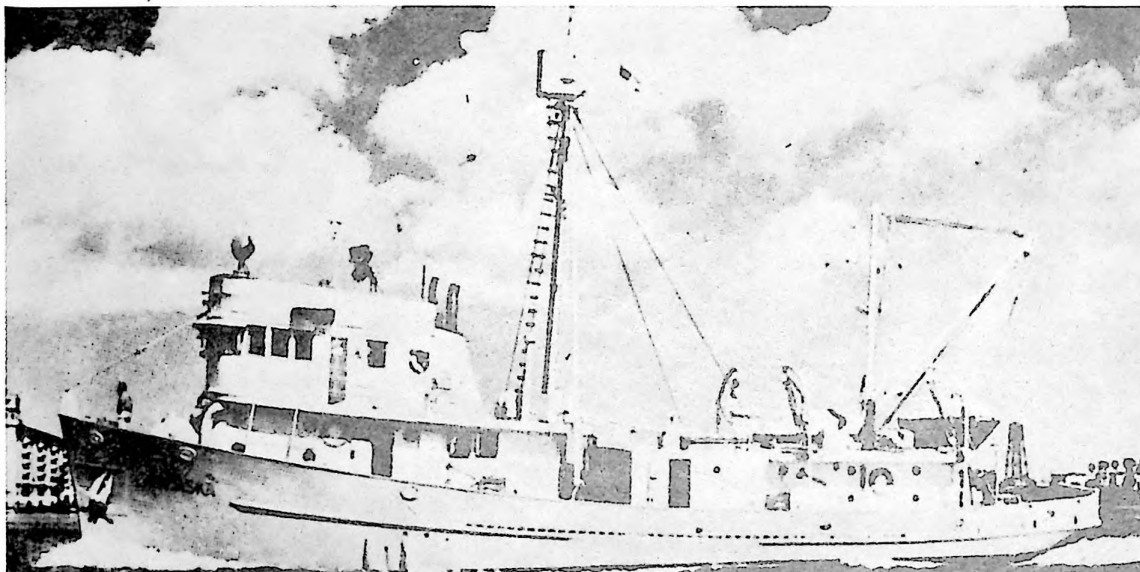
## TYPE OF OBSERVATIONS

Nansen casts, BT, and meteorological observations. All foreseeable types of study are provided for.

## REMARKS

Vessel is presently being converted. Named after Anton de Alaminos, one of the earliest students of the American Mediterranean. The first detailed map of what is now the southern United States was drawn up by Alaminos. A 24 ft. diesel work boat and 31 man life boat is carried on board.

# ALASKA



**TYPE:** Tuna Clipper, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1947	100'	26'	13.8'		272	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
9	11		6,500 miles	

## COMPLEMENT

CREW	SCIENTIFIC STAFF
2 (crew) 9 (students)	4

## **AFFILIATION**

State of California, Department of Fish and Game, 511 Tuna Street, Terminal Island, California.

## **PROPULSION**

Enterprise, 6-Cylinder diesel, 600 HP at 400 r.p.m., single fixed pitch propeller. Carries 60 tons fuel oil.

## **ELECTRICAL POWER**

Caterpillar diesel generator, 50 KW. Has 220V AC.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Raytheon "1,500" radar 32 mi. range, R.C.A. loran, Bendix Decca navigator.

Communication - Radio telephone Ray 80 HF.

Echosounders - Submarine Signal, 21 KC, 6,000 ft. range; Raytheon DE103 21 KC, 1,800 ft. range; Sea Scanner asdic, 1,600 ft. range.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Northern Dragger-hydraulic hydrographic winch with 20,000 ft. of 5/32" cable. Northern Dragger-hydraulic trawl winch with 5,400 ft. of 7/16" cable.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Has 320 sq. ft. of laboratory space available on and below the main deck.

## **HABITABILITY**

Carries 73 tons of fresh water. Has an evaporator.

### OTHER FEATURES

Vessel has four underwater observation windows on starboard side midship near the turn of the bilge. Has 60 ft. bilge keel.

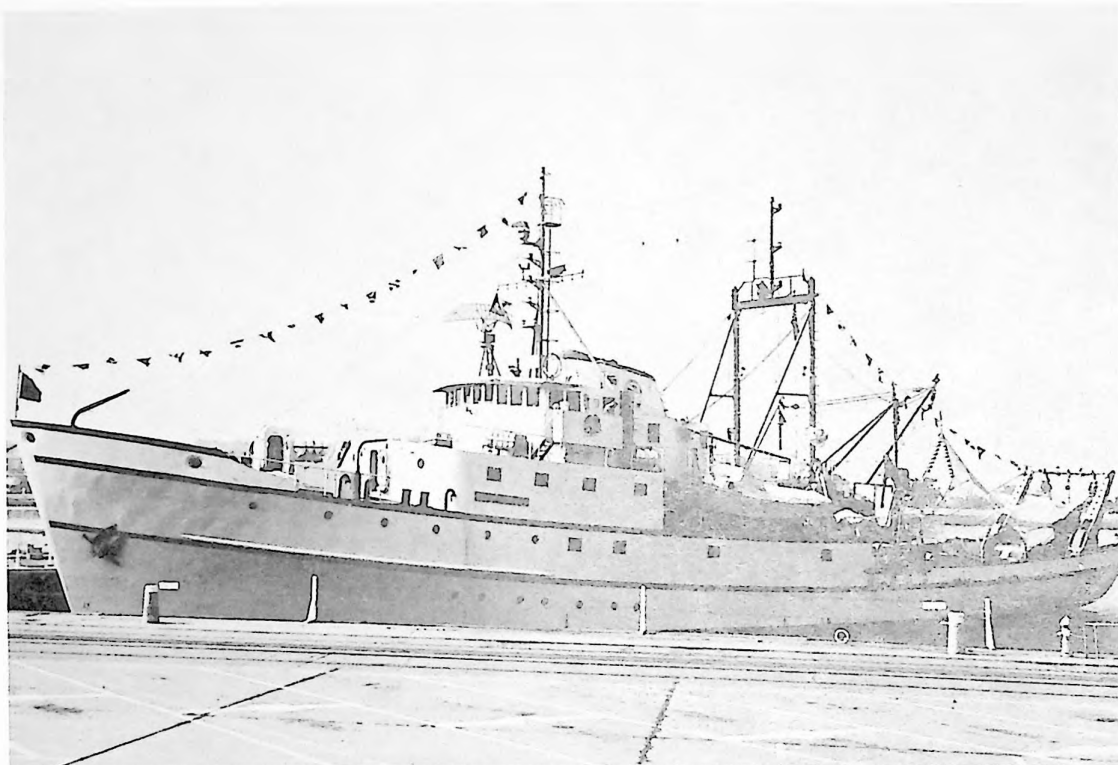
### TYPE OF OBSERVATIONS

Exploratory fishing, oceanographic, and biological observations.

### REMARKS

Vessel is sea kindly, has a fairly long rolling period. Handles well even in rough weather. Generally works along the west coast of U.S. and Mexico.

# ALBATROSS IV



**TYPE:** Stern Trawler, built as Research Vessel, steel hull, reinforced against ice.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
Scheduled for 1962	187'					

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
12			9,000 miles	

## COMPLEMENT

CREW	SCIENTIFIC STAFF
22	16

## **AFFILIATION**

Biological Research Laboratory, Fish and Wildlife Service, Bureau of Commercial Fisheries. Home port will be Woods Hole, Massachusetts.

## **PROPULSION**

Twin diesel engines, single controllable pitch propeller. Equipped with bow engine for steering and maneuvering on station, and a steerable Kort nozzle rudder, designed for holding position during research work.

## **ELECTRICAL POWER**

Will have sufficient power to perform most any research assignment.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Will be equipped with all the latest navigation and communication equipment.

Echosounders - Underwater sonar equipment, and late model echosounders.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Will have several winches of the latest design.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Complete laboratory and research facilities, including wet and dry laboratories, and an aft open deck laboratory for handling fish.

## **HABITABILITY**

Quarters comfortable, air-conditioned, reinforced against ice. Vessel can be used for general fishery and oceanographic research in any navigable waters, during all seasons and in all reasonable conditions of weather and temperature.

## OTHER FEATURES

Equipped with ramp to haul loaded nets aboard, permitting exploratory and experimental fishing during heavy weather. Has underwater television, closed-circuit television and electromagnetic log.

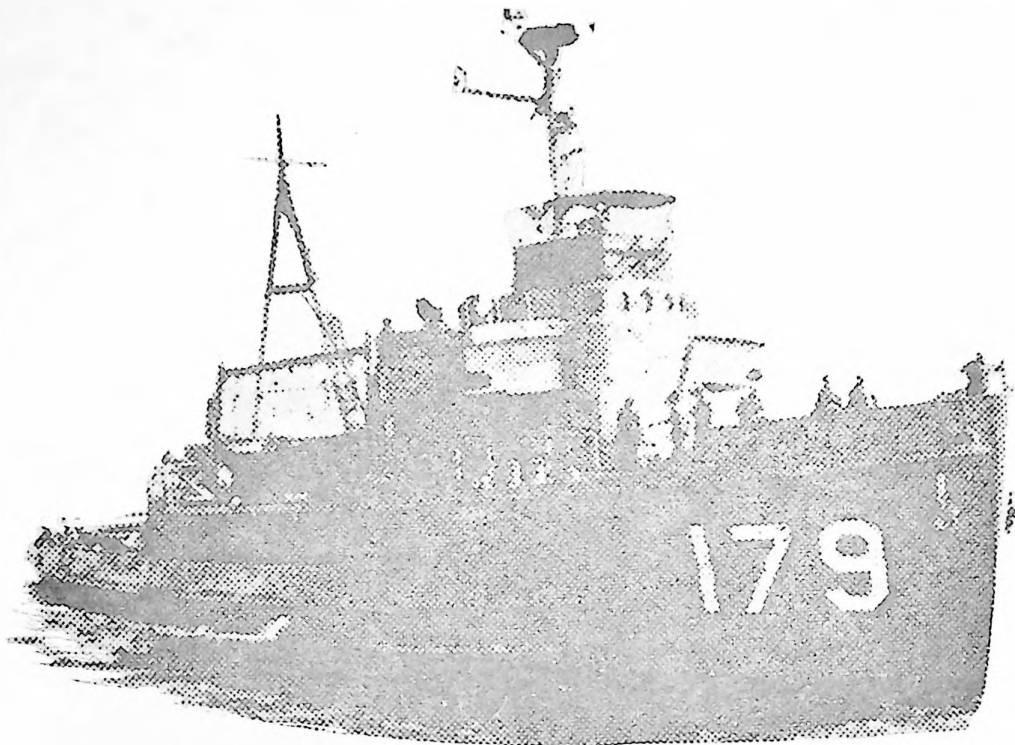
## TYPE OF OBSERVATIONS

Oceanographic and fisheries research.

## REMARKS

ALBATROSS IV carries on the traditional name of major fisheries research vessels of the U.S. Her predecessors, ALBATROSS I, carried on fishery research for 39 years; ALBATROSS II, engaged in research and explorations on mackerel and haddock fisheries and preliminary experiments with "savings" gear; ALBATROSS III, represented the first blending of efficient fish and scientific skills. Her career included an overall census of commercial fisheries on New England banks, experiments on refrigeration of fish at sea, development of "savings" gear, effects of waste-acid disposal off New York, locating and charting of wrecks and other obstacles destructive to nets and gear of commercial fishermen.

# ALLEGHENY



**TYPE:** ATA-179, Auxiliary Ocean Tug.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1944	143'	34'	13'	860 tons(full)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
13				

## COMPLEMENT

CREW	SCIENTIFIC STAFF
40	6



**AFFILIATION**

Hudson Laboratories, Columbia University.

**PROPULSION**

Single screw General Motors diesel-electric reduction drive, 1,500 HP.

**ELECTRICAL POWER**

No information.

**NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

No information.

**HYDROGRAPHIC WINCHES AND EQUIPMENT**

BT winch. Diesel driven trawl winch, capacity: 25,000 ft. of 1/2" wire rope, 10,000 lbs. Trolley beam, 10,000 lbs. capacity. A-frame, 10,000 lbs. capacity. Boom, 10,000 lbs. capacity.

**ACOUSTICAL CHARACTERISTICS**

No information.

**LABORATORIES**

No information.

**HABITABILITY**

No information. Presumably capable of operations in all ice-free waters.

**OTHER FEATURES**

No information.

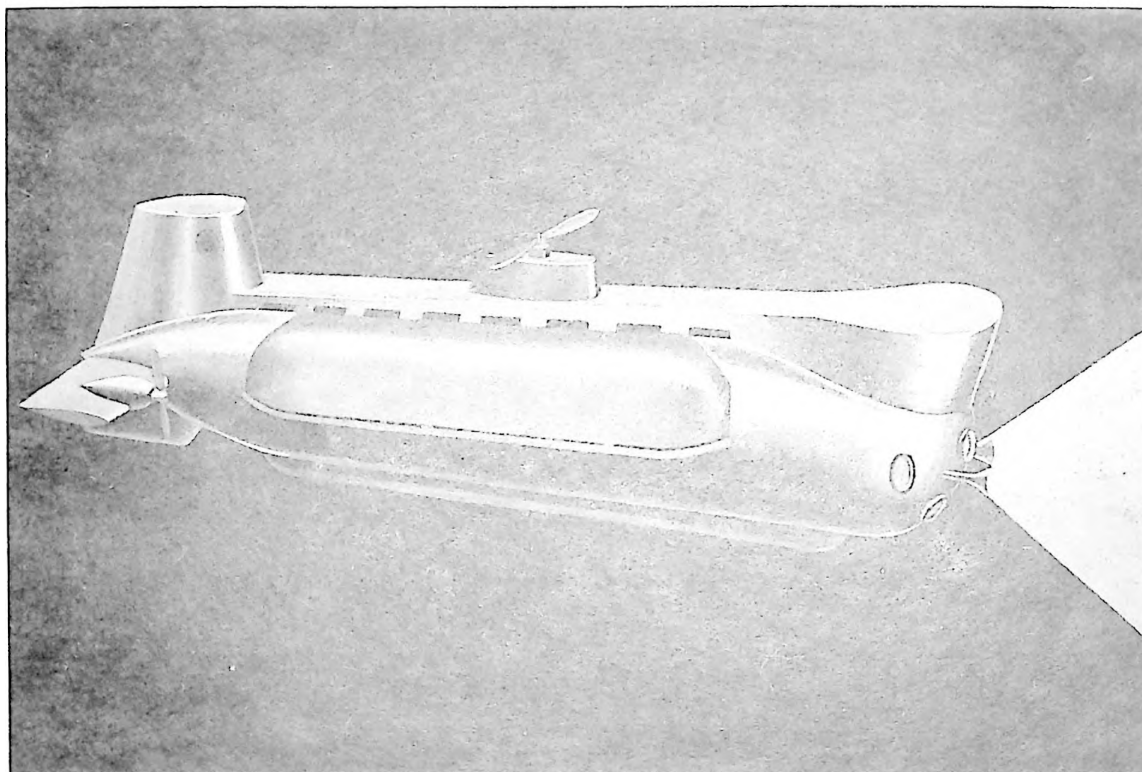
**TYPE OF OBSERVATIONS**

BT, hydrographic casts, coring.

**REMARKS**

Ship is used for equipment tests and field operations that do not require the full resources of the USNS GIBBS. It is also used in two-ship experiments to perform tasks requiring its lifting and towing capabilities.

# ALUMINAUT



**TYPE:** A submersible research vessel, aluminum hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
Under Construction	50' 8"	10'				

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
	4.8 submerged		96 miles*	36 hours +36 (emergency)

## COMPLEMENT

CREW	SCIENTIFIC STAFF
3 (total)	

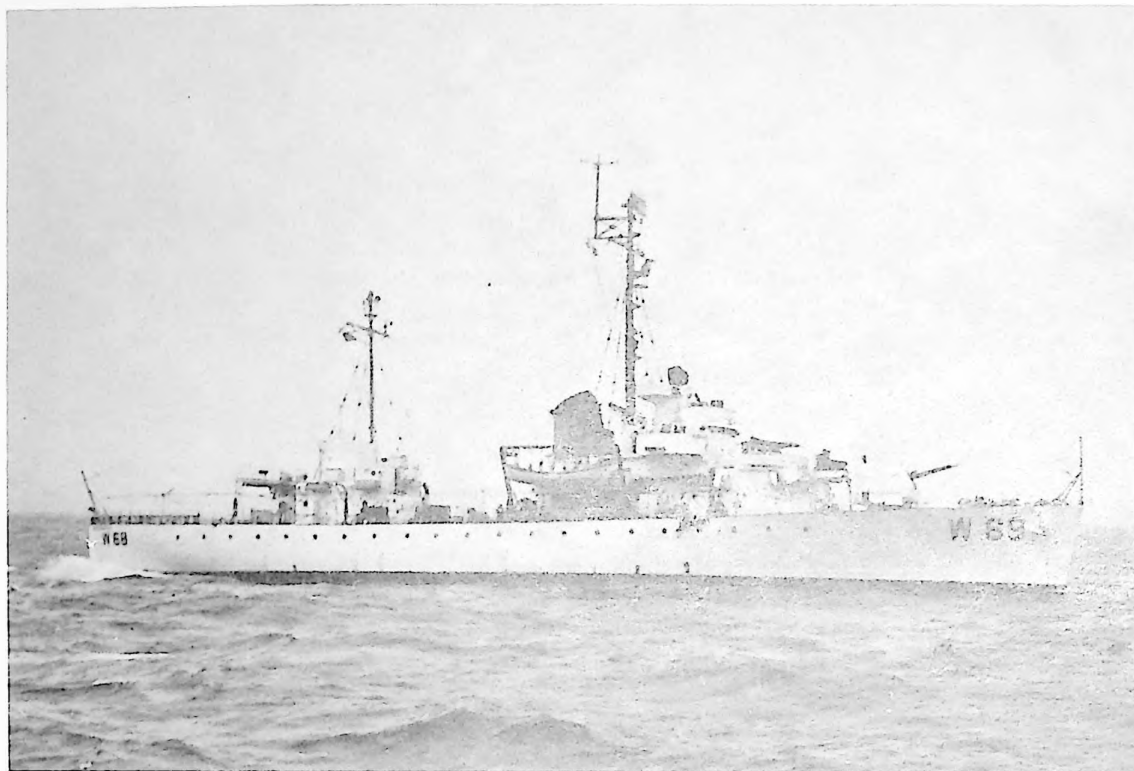
\* Four knots for 12-hour observation + 2 knots for 24-hour transit.

ALUMINAUT is under construction. Design based upon general concept of Wenk and further developed by Southwest Research Institute under a project initiated by the Reynolds Metals Company. Is being built by the Electric Boat Division of General Dynamics primarily to investigate new potential use of aluminum plate in ship and submarine hulls and also to perform oceanographic research. Reynolds Metals Company will lease the ALUMINAUT to WHOI, for a long-term navy-sponsored oceanographic research program. Specifications for the ALUMINAUT are as follows:

Operating depth .....	15,000 ft.
Normal payload scientific equipment .....	3,200-6,000 lbs.
Power available for equipment .....	64 KW hrs.
Vertical speed .....	3 ft/sec.--normal
	11 ft/sec.--maximum
Surface towing characteristics .....	10 kts.
Pressure hull, length of cylinder .....	33 ft. 4 in.
Pressure hull, inside diameter .....	84 in.
Draught--light condition .....	9 1/2 ft.
Draught--prior to dive .....	11 1/2 ft.
Test depth .....	17,000 ft.
Collapse depth .....	21,000 ft.
Submerged displacement at depths .....	149,140 lbs.
Ballast--jettisonable .....	7,000
shot .....	4,000
water .....	3,000
fixed .....	2,000
	16,000 lbs.

ALUMINAUT is expected to be completed in January 1964.

# ANDROSCOGGIN



**TYPE:** Coast Guard Cutter, "Lake" class, (WPG-68) steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1946	255'	43'	16.5' (full)	1,913 tons (full)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
	18			

## COMPLEMENT

CREW	SCIENTIFIC STAFF

## **AFFILIATION**

U. S. Coast Guard.

## **PROPULSION**

Steam turbo-electric, single screw propeller, 4,000 SHP.

## **ELECTRICAL POWER**

No information, but presumably has sufficient power to perform any oceanographic assignment.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - AN/SPS-29 radar.

Communication - Standard U. S. Coast Guard transmitters and receivers.

Echosounders - AN/UQN. sonic depth finders, PDR.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

BT winch and oceanographic winches.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Meteorological laboratory equipped with radiosonde equipment and other meteorological instruments. Chemistry laboratory with salinometer. Balloon inflation shelter.

## **HABITABILITY**

Quarters comfortable for long patrols on ocean weather station.

## **OTHER FEATURES**

No information.

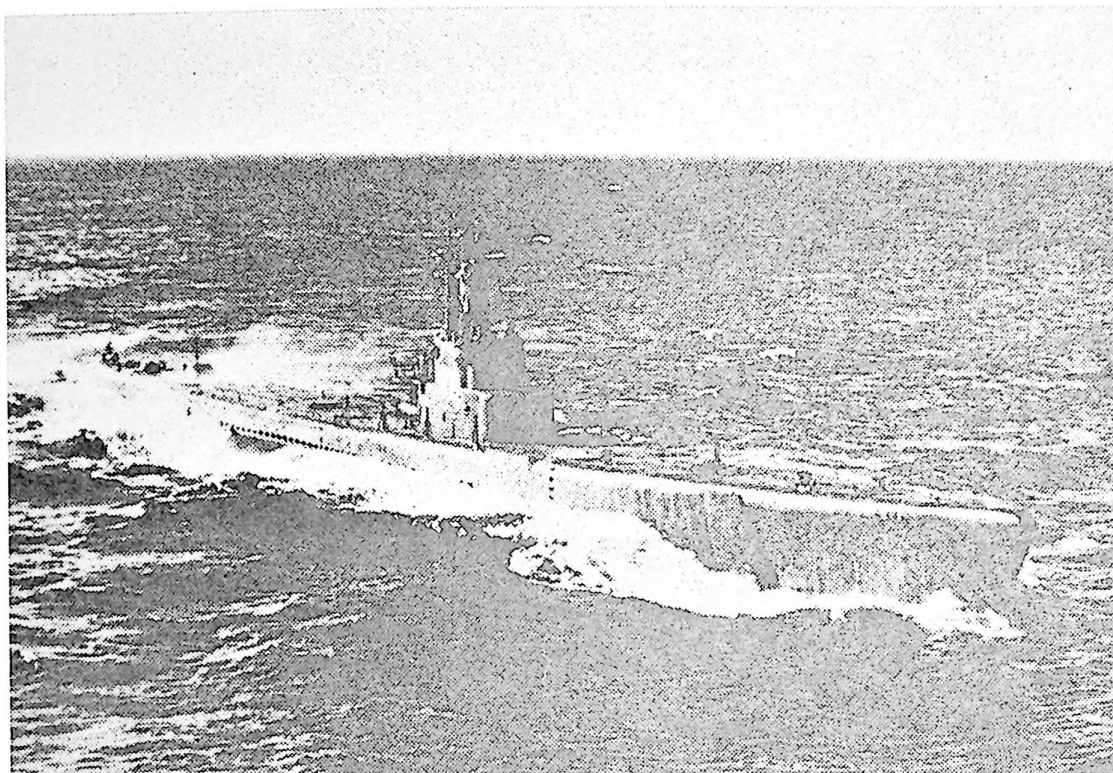
## TYPE OF OBSERVATIONS

Meteorological observations, soundings, sea and swell observations, fish, bird and other wildlife counts, subsurface temperatures, drift bottle releases, plankton samplings, and water and air samplings.

## REMARKS

Named after Indian tribe. Sister ships are: CHAUTAUQUA, ESCANABA, KLAMATH, WACHUSETT, MENDOTA, MINNETONKA, PONCHARTRAIN, WINONA, WINNEBAGO, OWASCO. These ships regularly serve as testing platforms for oceanographic and hydrographic research while manning ocean stations and performing other duties at sea.

# ARCHERFISH



**TYPE:** AGSS-311 Submarine, originally built as a Fleet-type, but completely demilitarized in 1959.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1943	311'	27'	15'	1526-Standard 1816-Surfaced 2425-Submerged		

## PERFORMANCE

CRUISING	SPEED (knots)		RANGE	ENDURANCE
	MAXIMUM	MINIMUM		
	20 (surfaced) 10 (submerged)		12,000 miles	

## COMPLEMENT

CREW	SCIENTIFIC STAFF
67	4

## **AFFILIATION**

U. S. Navy

## **PROPULSION**

Four GM two-stroke diesels develop 6,500 HP for two main motors while surfaced. Two batteries of 126 cells each drive the two main motors developing 4,600 HP while submerged. Two propellers. Fuel capacity 366 tons of oil in four tanks.

## **ELECTRICAL POWER**

From lighting voltage regulators, 120V DC. Four AC-DC, 120V, 60-cycle single-phase motor generator sets.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - SD-4 radar, SS radar, radio direction finder, gyrocompass, DRT.

Communication - UHF, VHF, AN/UQC-B underwater telephone.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Not applicable.

## **ACOUSTICAL CHARACTERISTICS**

Equipped with JT hydrophone, hydrophone, UQC-1 sonar, WCA sonar.

## **LABORATORIES**

Oceanographic electronics located in a console in aft end of forward torpedo room.

## **HABITABILITY**

Air-conditioned for tropic operation. Carries 14.7 tons fresh water in four tanks for drinking, and 4.4 tons in two tanks for battery. Two stills can produce 2,000 gals./day. Civilian quarters for 4 are in Wardroom Area. The stateroom has 4 berths, 4 lockers, a wardrobe closet and a Pullman-type sink. There are 4 water-closets and 3 showers on board.



## OTHER FEATURES

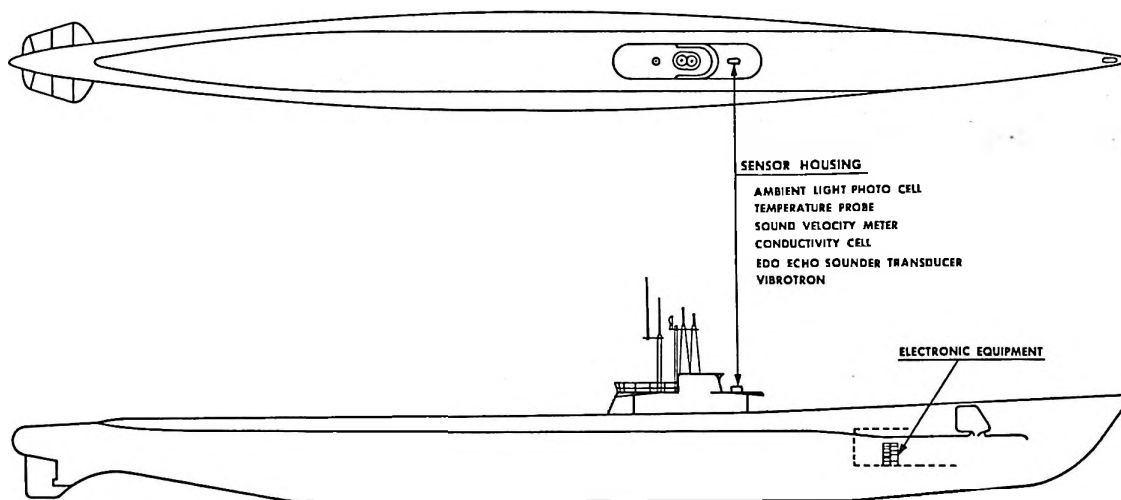
None.

## TYPE OF OBSERVATIONS

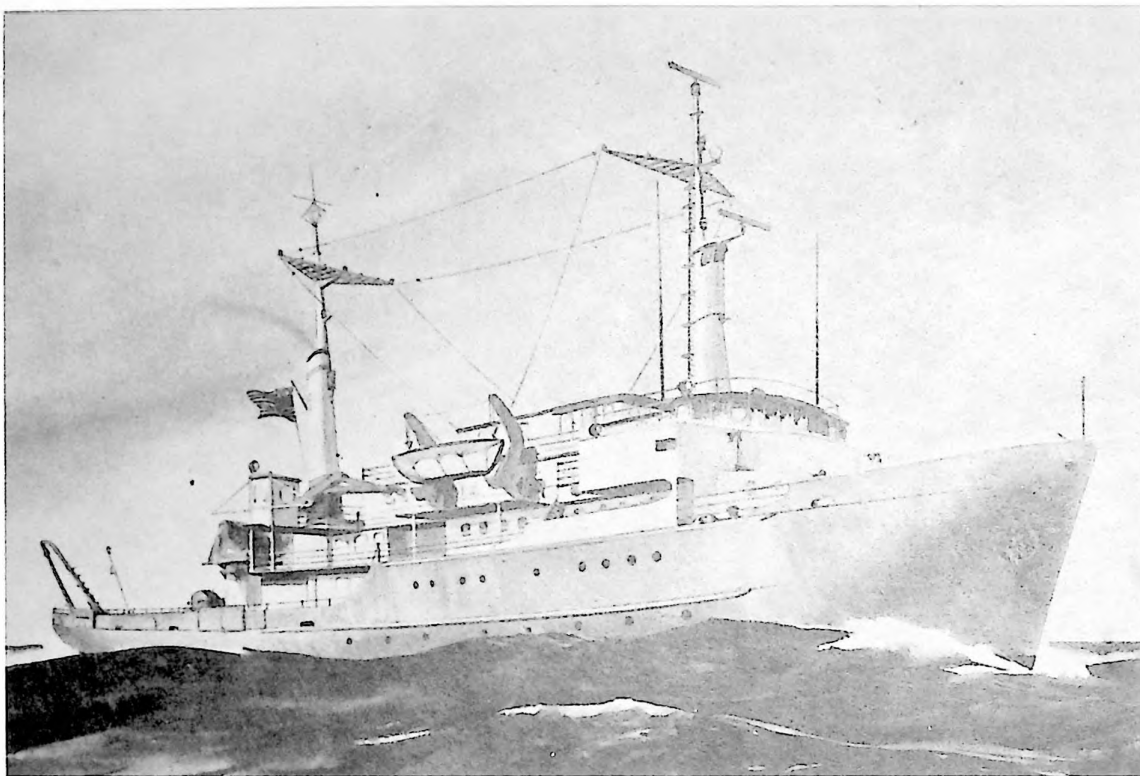
Digital punch-tape data (6 channels): time (GMT)-hours, minutes and seconds; date; position; depth of sensors in m.; velocity of sound in sea water in m./sec.; temperature of sea water in °C. Analog data: wave heights in ft.; Ambient light in absolute foot-candles; conductivity of sea water. Submarine BT.

## REMARKS

Used primarily to test and evaluate new instrumentation.



## ATLANTIS II



**TYPE:** Vessel will be of welded steel transversely framed construction. Designed specifically for oceanographic research.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1963	210'	44'	16'	2,100 tons	1,100	

### PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
12	13		8,000 miles	

### COMPLEMENT

CREW	SCIENTIFIC STAFF
28	25

## **AFFILIATION**

Owned and operated by Woods Hole Oceanographic Institution. Design and construction of the vessel are being paid for by the National Science Foundation.

## **PROPULSION**

Vessel has twin screws with twin rudders and a straight raked stem. Propelling machinery consist of two uniflow reciprocating engines, with steam supplied from two oil burning forced-draft, watertube steam generators or boilers. For greater maneuverability vessel will have a bow propulsion unit - a propeller mounted in a thwart-ships tunnel to move the bow to port or starboard.

## **ELECTRICAL POWER**

Two sets auxiliary generators producing 440V AC, 300 KW 60-cycle, three-phase alternating current. Also has a 60 KW diesel generator.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Vessel will carry advanced navigational communication and echo sounding equipment. All scientific gear will be installed at WHOI after the vessel is launched in early 1963.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Will be equipped with: steam powered trawl or deep sea winch, towed instrument or thermistor winch, two hydrographic winches, two BT winches, hydraulically actuated "A" frame, centerwell hoist and an inter-laboratory hoist.

## **ACOUSTICAL CHARACTERISTICS**

Vessel contains special features for reducing noise and vibration to minimum.

## **LABORATORIES**

Four laboratories and space for several portable laboratories which can be used interchangeably on deck and connected to ship's electrical and plumbing systems. These portable laboratories will be interchangeable so that installation and testing of equipment can be carried out on dockside while ship is at sea.

## **HABITABILITY**

All living quarters, public rooms, laboratories and similar work spaces will be air-conditioned. Capable of working from fringe ice to tropics. Potable water 21 long tons. Distillation apparatus on board.

## **OTHER FEATURES**

The vessel has a foremast of special design to accommodate an enclosed crow's nest for two men with access through the inside of the mast from the chart room. The mainmast is incorporated with the ship's stack and an exhaust gas velocity of 5,000 ft. per min. insures clean decks under operating conditions. Has antiroll tanks to reduce motion underway and on station. Bulbous bow unit will contain six glass windows for underwater observations. Chamber will be big enough for three people and will have echosounding equipment and racks for other scientific gear.

## **TYPE OF OBSERVATIONS**

Capable of all types of oceanographic survey and research.

## **REMARKS**

Ship is designed to do effective all weather oceanographic research from the fringe ice to the tropics and will be able to comfortably accommodate more than one scientific discipline on a given cruise. Named after the original research vessel, the famous ketch ATLANTIS which was built in 1931 for oceanographic work. Vessel is expected to be ready for research work in late spring of 1963.

## BLACK DOUGLAS



**TYPE:** Steel hull converted Motor Schooner.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1930	150'	32'	12'	371 tons		

### PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
10	11	4	4,500 miles	20 days

### COMPLEMENT

CREW	SCIENTIFIC STAFF
10-11	11

## **AFFILIATION**

U. S. Department of the Interior, Bureau of Commercial Fisheries.

## **PROPULSION**

Diesel, direct reversing single fixed blade screw, 400 HP, uses 2-D Mobil fuel diesel or equivalent. Fuel capacity 12,200 gal.

## **ELECTRICAL POWER**

Two, 60 KW, 120V DC auxiliary diesel generators. Has 60 KW DC available for scientific work. Limited AC power available.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Magnetic compass, CR-103 radar.

Communication - RBC receiver, RAO7 receiver. ART 13 voice and CW transmitter, 50W; TDF transmitter 2,000 to 9,500 KC.

Echosounder - NMC 1 (0 to 400 fms. and 0 to 4,000 fms.) and Raytheon Fathometer, Jr., 1-800 ft.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One hydrographic winch with 25,000 ft. of 3/16" wire, one dredge winch (mfd. by Markey) with 2,000 ft. of 5/8" wire and one BT winch. Ship will accommodate GEK winch.

## **ACOUSTICAL CHARACTERISTICS**

Not equipped for silent ship operation.

## **LABORATORIES**

One laboratory (150 sq. ft.) with fresh and salt water taps.

## **HABITABILITY**

Fitted with hot water heating system. Not prepared for either extreme tropical or cold weather operation. Fresh water capacity

12,000 gal., no distillation apparatus, no salt water showers. Has 7 single-berth rooms, 3 with bath; 3 four-berth rooms, and 1 two-berth room.

#### **OTHER FEATURES**

Fitted with a walk-in freezer (250 cu. ft.) for scientific use. Live bait tank with circulating sea water, cathode anti-electrolysis, bilge keels. Carries 14 ft. and 16 ft. outboard powered boats, 22 ft. metal lifeboat and two inflatable 10-man life rafts.

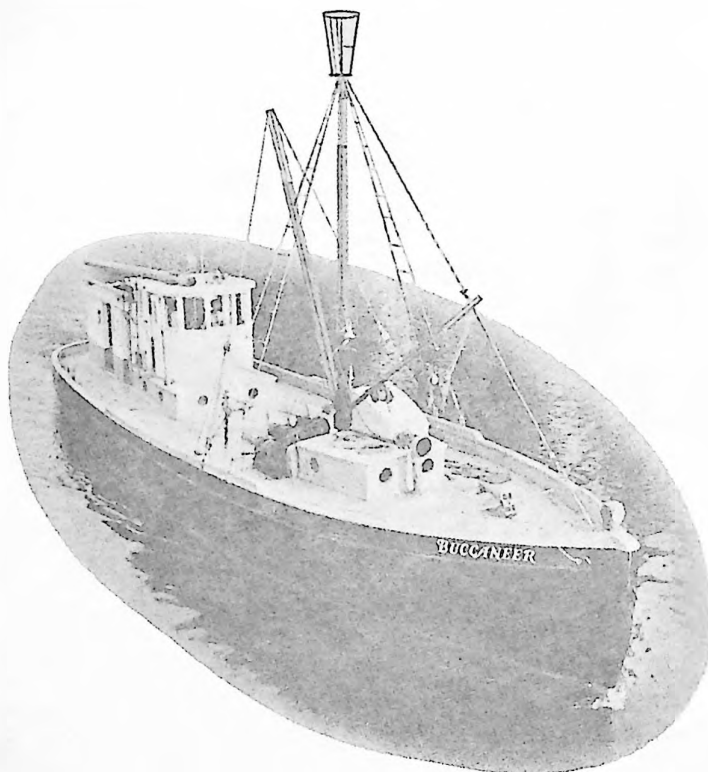
#### **TYPE OF OBSERVATIONS**

Plankton net tows, hydrographic casts, BT, nekton net tows, mid-water trawls, GEK, otter trawl, limited purse-seining, plankton pump sampling.

#### **REMARKS**

Ship is a converted 3-masted pleasure schooner. Sea-keeping and sea-kindliness qualities are good.

# BUCCANEER



**TYPE:** Fishing Vessel

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
	60'4"	16'	5'		30	22

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
	10		1,400 miles	

## COMPLEMENT

CREW	SCIENTIFIC STAFF
6 ( total)	



## **AFFILIATION**

Marine Exploration Company Incorporated, 561 W. 35th Place, Hialeah, Florida.

## **PROPULSION**

Has 225 HP, GM diesel engine.

## **ELECTRICAL POWER**

Has 20 KW, 110V DC auxiliary power.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - No information.

Communication - Has 100W ship-to-shore radio.

Echosounders - No information.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Lifting capacity: 5 tons over the side.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

No information.

## **HABITABILITY**

Sleeps six.

## **OTHER FEATURES**

Air compressor: Worthington 4 stage, 3,500 lb. sq. in., 15 cu. ft. Special devices, important to underwater research and recovery, include complex electronic equipment available when needed. Has standard diving gear and a 10 HP, 16 ft. outboard tender.

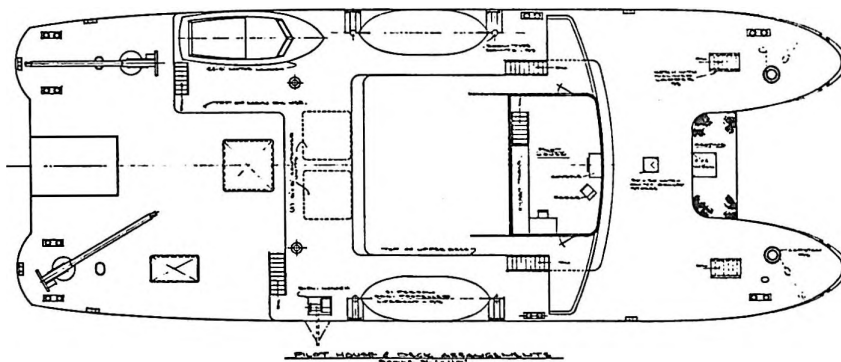
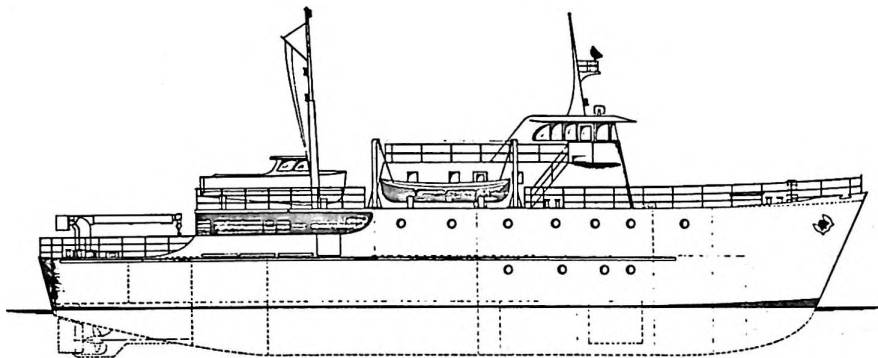
## **TYPE OF OBSERVATIONS**

Underwater research and exploration.

## **REMARKS**

Generally engaged in salvage and treasure explorations around the Florida Keys and in the Caribbean. Recently, ship's principal interest has been in the field of underwater research (oceanography).

# CATAMARAN VESSEL



**TYPE:** Twin-hulled steel, Catamaran Vessel, under construction.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
Expected launch 1963	141'	52'7"	9' (loaded)	760 tons (loaded)	over 300	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
12.6	13.5	1	5,000 miles design load	60 days design load

## COMPLEMENT

CREW	SCIENTIFIC STAFF
17 (max)	17 (max)

## **AFFILIATION**

Marine Laboratory, University of Miami.

## **PROPULSION**

Propulsion machinery will be chosen from either diesel-electric, solid props; direct diesel, solid props; or direct diesel with controllable pitch props. Shaft HP will be about 950. Because of the wide spread of the props, the vessel does not require any auxiliary bow propulsion unit for maneuvering at slow speeds. Full load fuel oil capacity is about 150 tons.

## **ELECTRICAL POWER**

Will have ample power to perform numerous oceanographic disciplines simultaneously.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Has not yet been equipped but \$50,000 will be available for navigation equipment.

Communication - Not yet equipped, presumably will have all the latest equipment.

Echosounders - Not yet equipped, presumably will have all the latest equipment.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Will be equipped with hydraulic cranes and articulated booms, trawl winch, two BT winches and two hydrographic winches.

## **ACOUSTICAL CHARACTERISTICS**

Acoustical considerations will be the prime factor in selection of propulsion system.

## **LABORATORIES**

Will have several laboratories including biology dry laboratory, biology wet laboratory, geology laboratory with cool room and freeze room adjacent, chemistry laboratory, acoustic and electronic laboratory, a darkroom and a scientific workshop.

## HABITABILITY

Accommodations comfortable and reasonably ample, has laundry and a hospital. Quarters and laboratories are air conditioned. Endurance at 12 knots fully loaded can be extended to 9,000 mi. and 90 days. Will carry about 20 tons of water and will have distillation apparatus.

## OTHER FEATURES

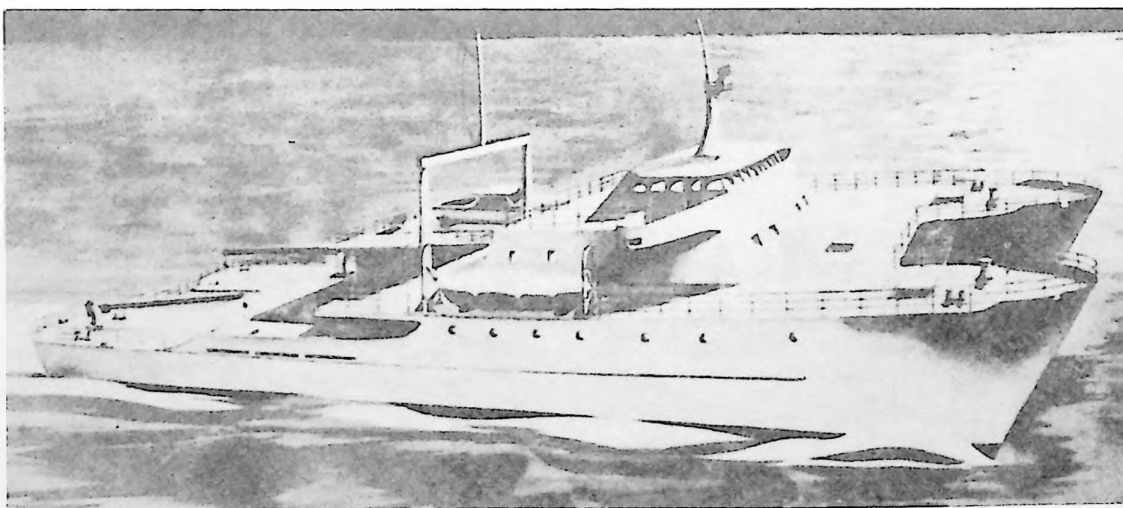
An unusually stable platform, rolling and pitching will be less than with a single-hulled vessel. No antirolling devices required. Hinged ramp at the stern for ease in handling trawl nets. When not in use, it is in raised position forming part of working deck area. Capable of extended voyages in deep sea service and also capable of shoal water operations with draft limited to 8 ft. Center wells and under-water observation area within hull.

## TYPE OF OBSERVATIONS

General oceanographic survey and research.

## REMARKS

Tests indicate that a catamaran vessel has superior qualities as an oceanographic research tool. Compared to an equivalent single hull vessel, it has (1) more usable deck area, better oriented for maximum scientific use; (2) more features for better scientific work and more versatility in the work it can do and be adapted to do; (3) a higher degree of stability, maneuverability and sea-keeping ability, and without accessory devices; (4) more speed at less power; (5) more economical to construct and operate than the single hull vessel of comparative scientific utility. A single hull vessel would require over 50% greater displacement to achieve the same scientific areas and features of this catamaran vessel.



# CHARLES H. GILBERT



**TYPE:** Steel Trawler especially designed for oceanographic and fishery research work.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1952	122'11"	21'1"	10'6"	383.4	196.5	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
9.0	11.0		8,500 miles	80 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
12	5

## **AFFILIATION**

U. S. Fish & Wildlife Service, Bureau of Commercial Fisheries,  
Honolulu, Hawaii.

## **PROPULSION**

Caterpillar turbo charged, Model D-397, 550 HP, single fixed screw.  
Uses diesel oil. Auxiliary machinery: two GM 4-71-RC56, 110 HP  
generators.

## **ELECTRICAL POWER**

Has 110V AC, 5 KW, 60-cycle, single-phase; and 115V DC, 40 KW.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Celestial navigation equipment; DF, Kaar; loran, Sperry,  
Mark 2, Model 1; radar, RCA CR-103; gyrocompass, Sperry, Mark 22,  
Model 1.

Communication - RCA 75W, TCP-2 T/R; Northern 250W, 388C, CW and voice;  
Collins, 100W, ART-13, CW and voice; National HRO-50T1, CW and voice  
receiver; Collins BC 348Q, CW and voice receiver. Range of frequencies  
(Transmitting) 200-18,000 KC; (receiving) 0-30,000 KC.

Echosounding - Echorecorders, Edo AN/UQN-1B, 6,000 fms.; and Bendix,  
Model DR6-A, 400 fms.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Hydrographic winches with 3,500 ft. of 1/4" dia., and 6,500 ft. of  
3/16" wire; BT winch with 1,200 ft. of 3/32" wire; double drum  
electric trawl winch (25 HP) with 5,000 ft. of 1/2" wire on each  
drum; Izui, Japanese longline hauler, 3 HP; Puretic power block for  
gill nets.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Equipped with wet and dry laboratories for biological and chemical  
work.

## HABITABILITY

Fresh water capacity 50.96 tons. Used in mid-latitudes and tropical areas.

## OTHER FEATURES

New bulbous bow with bow and stern observation chambers affords wide-angle view well below the waterline. Stern observation chamber with communication to bridge is maintained by a sound-powered headphone. Has bilge keels and portable bait tank.

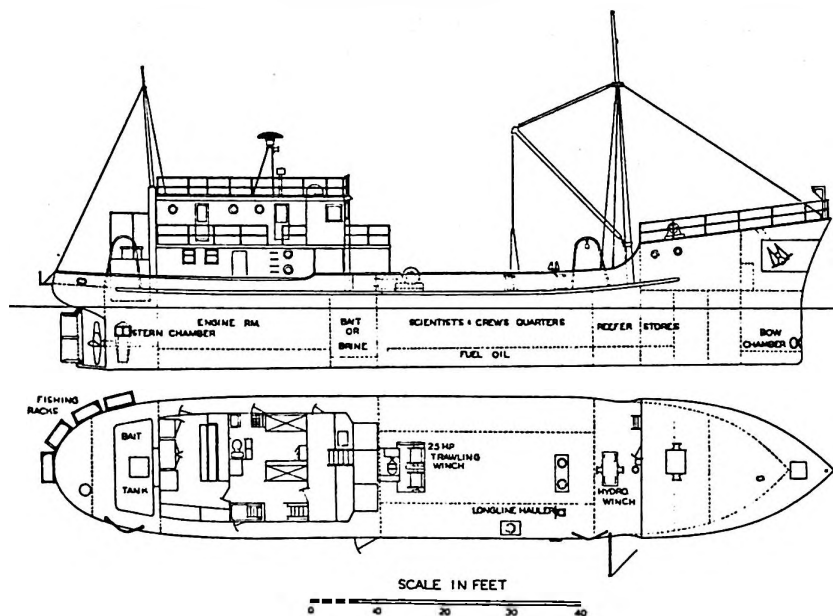
## TYPE OF OBSERVATIONS

BT; hydrographic casts, plankton tows, current observations, continuous temperature/depth recording, meteorological observations.

## REMARKS

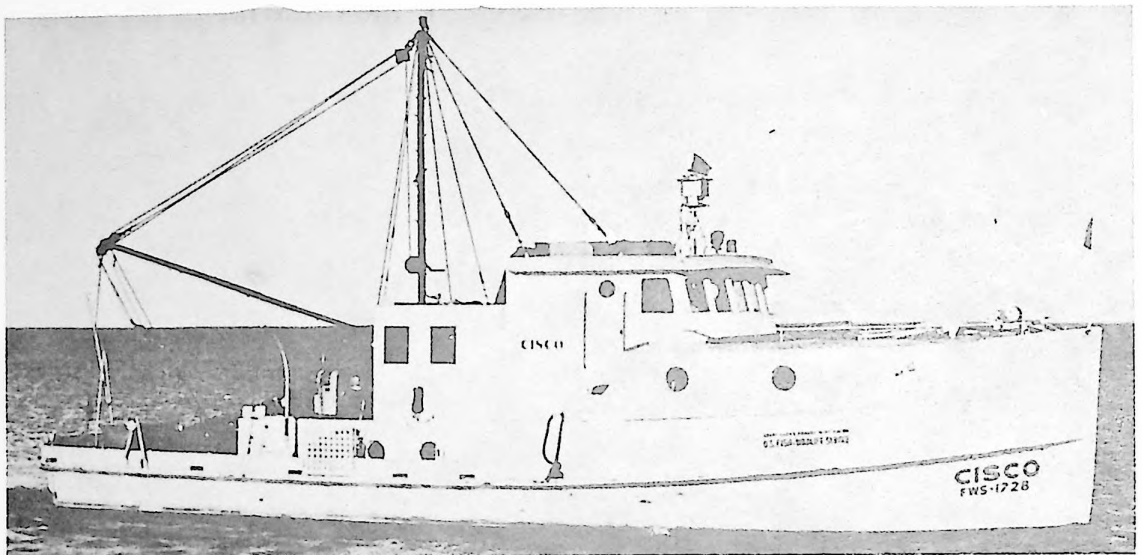
Underwater viewing chambers in bulbous bow are advantageous, both from the point of view of effectiveness in observing fish and from that of structural design. With alteration of bow in 1959, vessel now provides a more steady work platform. Ship moves well in head sea.

THE CHARLES H GILBERT





# CISCO



TYPE: Steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1951	60.5'	17.8'	8'		74'	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
7	8 3/4		1,400 miles	one day

## COMPLEMENT

CREW	SCIENTIFIC STAFF
4	5

## **AFFILIATION**

U. S. Bureau of Commercial Fisheries, Biological Laboratory, Ann Arbor, Michigan.

## **PROPULSION**

Murphy diesel, 170 SHP, with one fixed pitch propeller. Carries 7 short tons of fuel oil.

## **ELECTRICAL POWER**

Has 220V and 110V AC from one Caterpillar diesel generator, 20 KW; and one Fairbanks-Morse diesel generator, 3 KW.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Radar, RCA CR-105, range 20 miles.

Communication - Pierce-Simpson, medium frequency Marine, 130W.

Echosounders - Bendix DR-12, 50 KC, range 1,200 ft.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Hydrographic winches: one U. S. Navy E 15/S hoist (3 HP electric) with 2,000 ft. of wire; one 20 HP trawl winch (Northern dragger double drum, hydraulic); one Crosley, 36 in. gasoline net trawler and one Briggs-Stratton gasoline net puller engine.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Space on main deck 200 sq. ft.

## **HABITABILITY**

Carries 1.5 tons of fresh water.

## **OTHER FEATURES**

None.

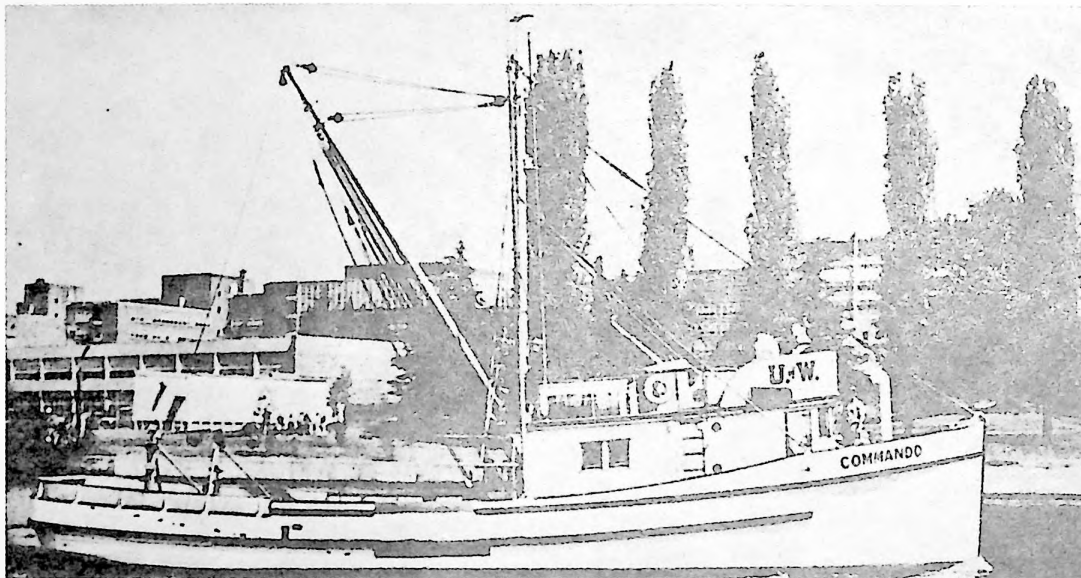
**TYPE OF OBSERVATIONS**

BT, water samplers, bottom grabs, plankton hauls, meteorological observations and exploratory fishing.

**REMARKS**

Not sea kindly.

# COMMANDO



**TYPE:** Fishing Boat, wood hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1944	67'	18.2'	8.5'		69	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
9	10 1/2		260 miles	14 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
4	5

## **AFFILIATION**

College of Fisheries, University of Washington, Seattle, Washington.

## **PROPULSION**

Cummins diesel 250 HP, with fixed-pitch propeller. Carries 9 1/4 tons fuel oil.

## **ELECTRICAL POWER**

Has 110V AC, 220V AC and 115V DC from General Motors diesel 30 KW generator.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Bendix radar, 20 miles; Emerson Loran, 800 miles.

Communication - Apelco radio-telephone, 240W.

Echosounders - Bendix recorder, 200 fm.; Simrad recorder, 2,000 fm.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Rowe Machine Works, hydraulic hydrographic winch with 6,500 ft. of cable and 1,000 lbs. pull. H. A. Thompson, hydraulic anchor winch with 250 fms. of cable and 4,000 lbs. pull. Rowe hydraulic double drum trawl winch with 6,000 ft. of 1/2" wire and 4,000 lbs. pull on each drum.

## **ACOUSTICAL CHARACTERISTICS**

Has hydrophones and other acoustic equipment.

## **LABORATORIES**

Has 126 sq. ft. of space below main deck.

## **HABITABILITY**

Carries 2 1/2 tons of fresh water.

## **OTHER FEATURES**

Paravane stabilizers.

### TYPE OF OBSERVATIONS

Generally engaged in training and research in fisheries biology and fisheries technology, but may be equipped as needed with other oceanographic and meteorological gear.

### REMARKS

Generally works in the northeast Pacific Ocean.

## EMPIRE STATE IV



**TYPE:** Training Ship. Ex - U.S.N.S. Henry Gibbins, T-AP 183, steel hull. Converted to a transport before completion. This ship transported 4,200 troops and carried a crew of 169.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1942	489'	69.5'	25.5' (loaded)	15,470 (full) 11,281 (light)	12,162	6,576

### PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
13	18.3	bear steerage way 10 revolutions	13,000 mi.(normal) 11,500 mi.(sustained)	12 - 14 days full complement

### COMPLEMENT

CREW	SCIENTIFIC STAFF
105	460 cadets 2 scientists

## **AFFILIATION**

State University of New York Maritime College (oldest maritime college in U.S.)

## **PROPULSION**

Geared turbine (cross Compound Impulse Reaction) built by GE. Single fixed-blade screw, pitch 22 1/4 ft., Bronze Right 42,850 lbs. Operating HP 6,800, maximum HP 9,350. Uses Bunker "C" fuel and occasionally U.S. Navy Special.

## **ELECTRICAL POWER**

Ship has three DC generators, 300 KW each and two AC motor generators 20 KW each (cannot be paralld). Normal DC load requirements range from 480 to 600 KW. During peak load periods of 600 to 700 KW three DC generators may be required, but ship always tries to operate on two and leave one as a stand-by. Instruments with large power requirements must be operated during periods of low KW loads which occur periodically during the day. Characteristics: DC current - 300 KW output, 120/240V, maximum amps. 1250/generator. AC current - 25 KVA output, 0.8 lagging power factor, 20 KW single phase, 120V 208 amps. 60 c.p.s. No battery power available.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation: Master gyro (Sperry MK-14), six gyro repeaters (Sperry MK-8 Med. 0), gyro pilot, Sperry 3 meter radar, Raytheon "Pathfinder" radar, two ANSPN 7 loran, Fesendon Fathometer (Submarine Signal Co.), RDF (R.M.C.A.) AR 8703 BX, and sonic depth finder.

Communication: Transmitters: one RCA-8010C, one RCA ET-8019A (will be replaced by Mackay type MRU-23A Consul in 1963), one RCA ET-8003, one Mackay 214D radiophone, one U.S. Navy frequency meter LM-21, one RCA AR-8516, one RCA AR-8506B, one National NC 183-D, one Mackay 128 AY, one RCA AR-8603, and one Mackay 5100C.

Echosounders: Raytheon Fathometer, Indicator DE 102 and recorder DE 103. Indicator range to 240 ft. or fms. Recorder range to 600 ft. or fms. Precision of both is within 2 percent. Ping length cannot be changed.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Two winches will be placed on board in the near future.



## **ACOUSTICAL CHARACTERISTICS**

Ship cannot be placed in noiseless condition.

## **LABORATORIES**

Laboratory (198 sq.ft.) with AC current, hot and cold water, ample ventilation and toilet facilities. Formerly used for meteorological research by MSTs.

## **HABITABILITY**

Vessel prepared to work in tropics but not in arctic. Carries 107,300 gals. potable water, and 142,410 gals. reserve feedwater. Distillation capacity 80,000 gals. (Foster Wheeler low pressure submerged tubes, triple effect). Salt water showers not available and not required. No facilities for women scientists.

## **OTHER FEATURES**

Has two bilge keels. Can make oceanographic observations up to rough sea.

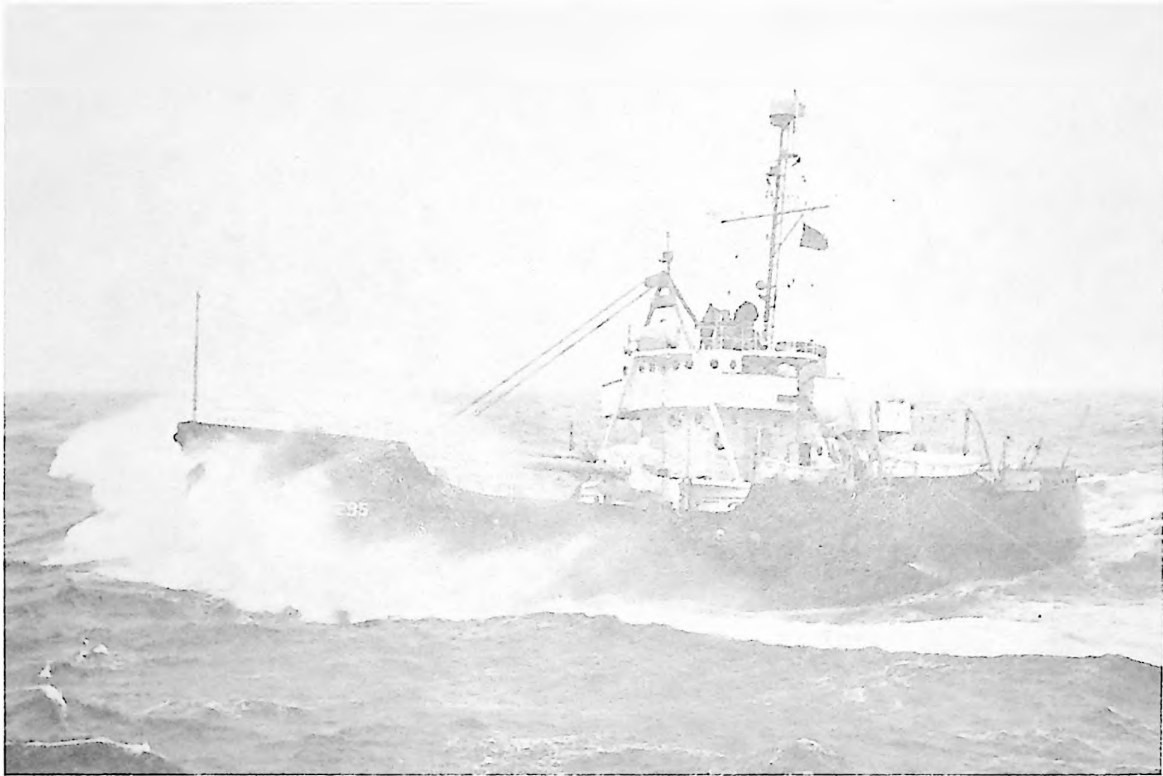
## **TYPE OF OBSERVATIONS**

Hydrographic casts, underway observations (BT).

## **REMARKS**

Vessel is primarily used for cadet training but future plans call for an increased oceanographic training program to be included with other basic maritime training.

# EVERGREEN



**TYPE:** WAGO-295, USCG Tender Class with icebreaking capability.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1943	180'	37'	13'	1,025 tons		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
12	12.5	3	19,000 miles	45 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
45	7

## **AFFILIATION**

U.S. Coast Guard.

## **PROPULSION**

Single screw, diesel electric, 1,200 HP.

## **ELECTRICAL POWER**

Has 120/240 AC, 50 KVA; 2 KW DC.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - SPS-23 radar, gyrocompass, RDF, loran, patent log.

Communication - 500W MF-HF transmitters; HF, VHF, UHF, transceivers.

Echosounders - AN-c EDO (0-6,000 fms.)

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Two Wheeler oceanographic winches, each with 20,000 ft. of 5/32" wire;  
BT - winch; surface tow winch 600 ft. of 5/8" wire.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

One oceanographic laboratory for determination of salinity, oxygen, and other analyses.

## **HABITABILITY**

Service type crews quarters, staterooms for scientists; lounges. Fresh water evaporators and showers. Air-conditioned laboratory.

## **OTHER FEATURES**

Icebreaking capability. Twenty ton buoy handling boom. Large cargo hold. Portable balloon inflation shelter for upper air observations.

### TYPE OF OBSERVATIONS

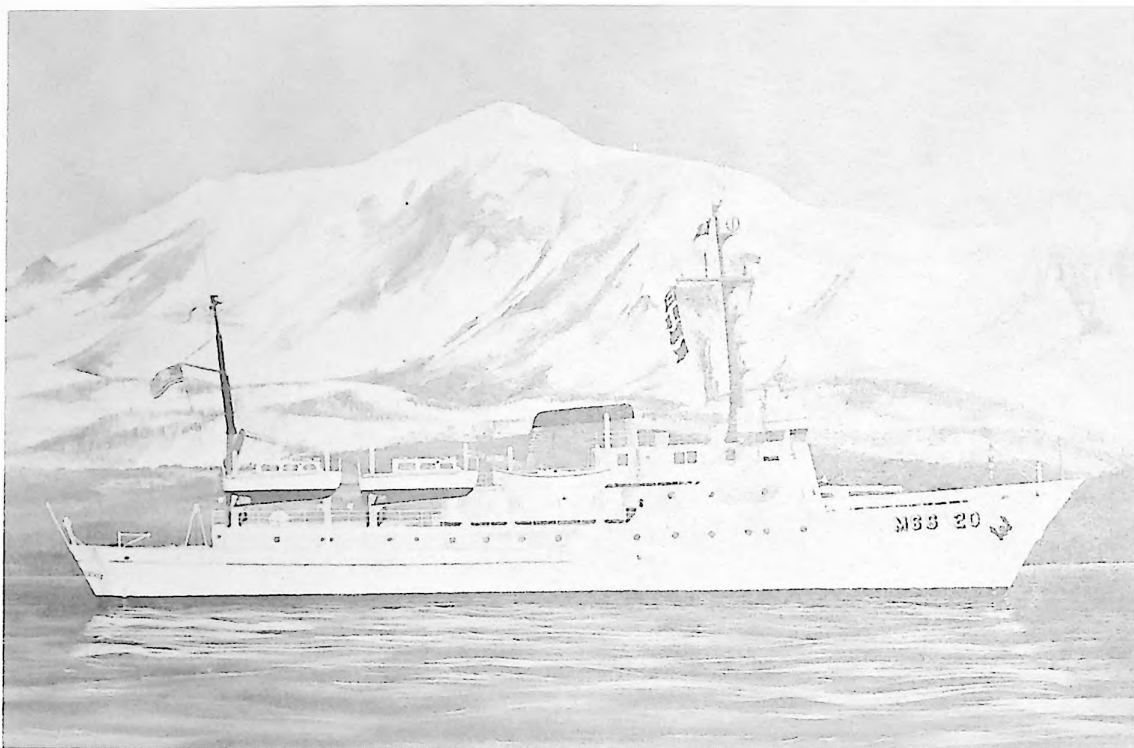
Bathymetry, BT, Nansen casts, bottom samples, oceanographic buoy handling, GEK, plankton trawls, weather observations.

### REMARKS

Employed for oceanographic and current surveys of the Grand Banks, Labrador Sea and Davis Strait in connection with the International Ice Patrol.

# FAIRWEATHER

# RAINIER



**TYPE:** MSS-20 and MSS-21, Class II Hydrographic Survey Ships, ice strengthened steel hulls. Limited oceanographic capabilities.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
Delivery: MSS-20; 1964 MSS-21; 1965	Overall 220' 8" Waterline 197'	42'	13'	1,615 L.T. (full load)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
	14.5	Variable	8,000 miles	24 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
82 (total)	

## **AFFILIATION**

U.S. Coast and Geodetic Survey.

## **PROPULSION**

Twin screw diesel, 1,200 SHP each, with controllable pitch propellers controlled from the engine room, pilot house, or after control station; also, equipped with a tunnel bow thruster delivering 5,000 lbs. thrust from a 200 BHP diesel engine.

## **ELECTRICAL POWER**

Has sufficient electrical power to perform most oceanographic disciplines.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Two deep water depth recorders, Navy Type AN/UQN-1B; two shoal water depth recorders, Raytheon DE-723; one precision depth recorder; one loran "A" receiver-indicator; two surface search radars; one radio direction finder; one shoran system; one HI-FIX positioning system; one electro magnetic log, Navy Type; one gyrocompass system; two gyro pilot systems.

Communication - One main, medium and HF console; two single sideband HF transceivers; four single sideband transceivers, for launches; one 150W HF transceiver; two VHF transceivers; four portable VHF transceivers; three receivers for standard radio communication; one portable lifeboat transceiver.

Echosounder - Described under navigation equipment.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Two BT winches, electro-hydraulic. The drum capacity is 4,000 ft. of 3/32" dia., 7 x 7 aircraft cord stainless steel wire rope. One double drum oceanographic winch, electro-hydraulic. The upper drum capacity is 6,000 ft. of .298" dia. electrical double armored cable, 6 conductors. The lower drum capacity is 15,000 ft. of 3/16" dia. 3 x 19 wire rope. One dredge and trawl winch, electro-hydraulic. The drum capacity is 6,000 ft. of 3/8" dia. 3 x 19 wire rope.

## **ACOUSTICAL CHARACTERISTICS**

Ship cannot be used for silent operations.

## LABORATORIES

Plotting room and field office - 360 sq. ft. Radio room and electronics workshop 276 sq. ft., oceanographic lab. 240 sq. ft. The oceanographic laboratory will include a magnetometer.

## HABITABILITY

Able to operate in both tropical and arctic areas. Will be air-conditioned in all living and enclosed working areas. No provisions for women scientists. Will carry 50 tons of fresh water and two 3,000 gals./day distilling plants.

## OTHER FEATURES

The ship will be automated by a centralized engine room control station and consoles, which, together with certain controls and indicators in the pilot house consoles, will provide for effective one man monitoring and control of the machinery plant operations and permit maneuvering of the ship with respect to engine speed, propeller pitch, and steering at the pilot house control console, including bow thruster operation. Data recording and logger typewriting equipment will log temperature and pressures. Automatic logging will also be provided for recording propeller r.p.m., direction and degree of propeller pitch or controller position number, time and date. Fitted with an anti-roll tank under pilot house using potable water for the stabilizing liquid.

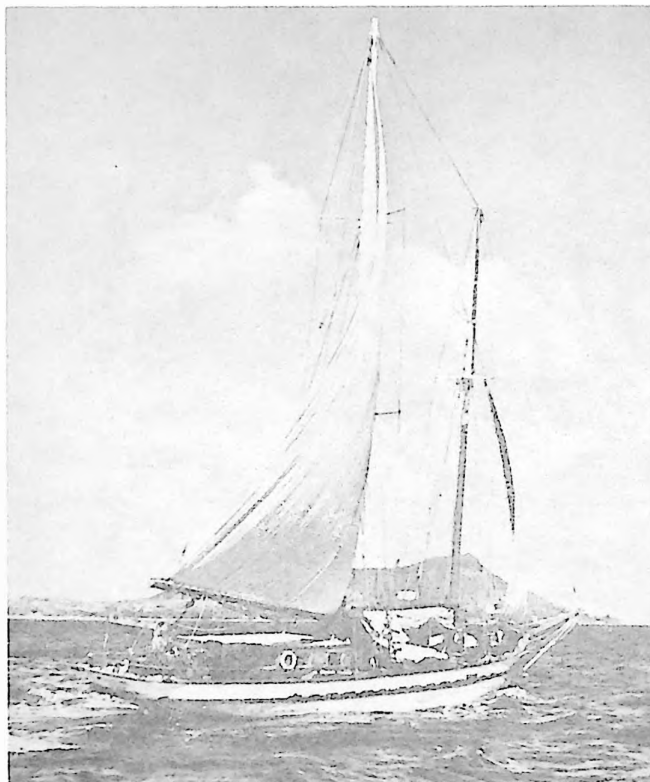
## TYPE OF OBSERVATIONS

Continuous bottom profile, BT (0-900 ft.), bottom samples, (snapper, coring, dredging), current observations, Nansen bottle casts, plankton casts, magnetic observations (with towed proton precision magnetometer), gravity observations and Geomagnetoelectrokinetograph System.

## REMARKS

Under construction.

# FIESTA



**TYPE:** Teak hulled Auxiliary Schooner.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1932	72'	18'	9' (full)	75 tons	50	30

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
7	8 1/2	2	1,500 mi. (power) unlimited (sail)	30 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
4	6



## **AFFILIATION**

Chartered by Hawaii Institute of Geophysics from Martin Vitousek, owner.

## **PROPULSION**

GM 671 diesel, 175 HP, 3:1 reduction. Sails available. Single fixed pitch propeller, 42" x 24". Uses automotive diesel fuel, 1,200 gal. capacity.

## **ELECTRICAL POWER**

One 10 KW 110V DC diesel generator, one 2 1/2 KW 110V DC generator-driven by main engine. Has 100 amp.-hrs. battery bank. Two 500W 115V AC 60 converters. Ship requires 2 1/2 KW. Has 28V DC, 50 amp.-hrs. available from emergency radio batteries.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Magnetic compass, ship log, radio direction finder, loran.

Communication - 180W radio telephone (ART-13) 1.7-18 MC, Amateur Radio Station (Collins KWM-2A SSB), Citizens radio equipment including two walkie-talkies for boat and shore parties. Emergency lifeboat transmitter.

Echosounders - Short range echosounder for navigational purposes, may be dismounted and used in skiff.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

A 5 HP anchor winch is equipped with special capstan to handle 1/4" Amergraph cable at high speed. Hand BT winch.

## **ACOUSTICAL CHARACTERISTICS**

Battery power available for quiet ship work. Can be used for very sensitive hydrophone work.

## **LABORATORIES**

No laboratory space available. Deckhouse convenient to house electronic equipment.

### **HABITABILITY**

Ship is primarily for use in tropics. Fresh water capacity 1,400 gals. No distillation apparatus.

### **OTHER FEATURES**

Sails and deep keel act as antirolling devices.

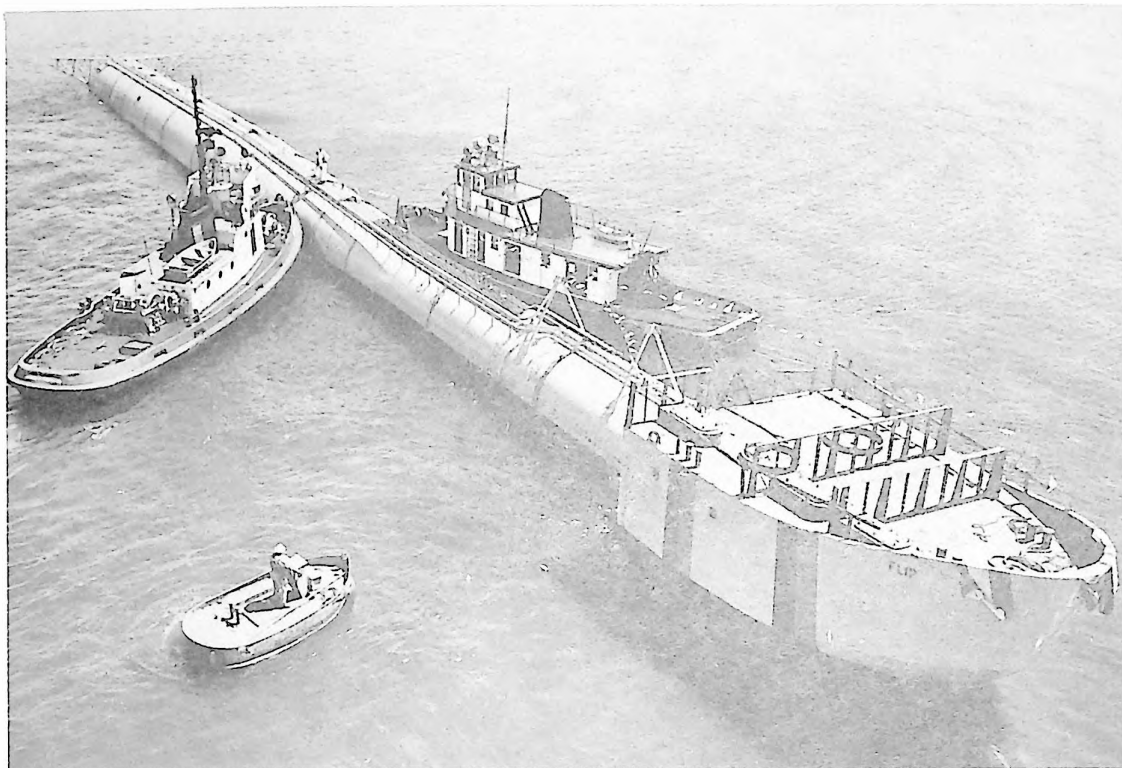
### **TYPE OF OBSERVATIONS**

Hydrographic casts (limited depth), shallow dredging, continuous magnetic observations (towed magnetometer), seismic work, hydrophone observations, limited cable work in connection with bottom-mounted transducers.

### **REMARKS**

Limited to single purpose cruises. Although small, this ship has made several long cruises (over 2,000 mi.) engaged in scientific work, most of which was in the open sea.

# FLIP



**TYPE:** Manned ocean buoy, FLIP, Floating Instrument Platform, steel hull. Was originally designed and built as a stable platform from which to perform acoustic experiments at sea.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
launched June 22, 1962	355'	25'	13'8" hor 300' vert.		1,500 hor 2,200 vert	574

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
Towed horizontally up to 11 knots				2 weeks, each station

## COMPLEMENT

CREW	SCIENTIFIC STAFF
3	3

## **AFFILIATION**

It belongs to and is operated by the University of California Marine Physical Laboratory of the Scripps Institution of Oceanography, San Diego 52, California, under contract to the Office of Naval Research. Technically, FLIP is owned by the Office of Naval Research and is operated under contract by the Marine Physical Laboratory.

## **PROPULSION**

None. In the vertical position an orientation motor will allow FLIP to be rotated about its longitudinal axis. Has 25 HP electro-hydraulic orientation system. Diesel oil for electrical power generation.

## **ELECTRICAL POWER**

Has one 127-1/2 KW, two 60 KW and one 7-1/2 KW generators. Uses about 50 KW with orientation motor operating. For scientific equipment 100 KW, with not more than 60 KW into a single load. Power to the board from the two 60 KW generators driven by General Motors model 6-71 diesel engines is 440V 3 phase, 60-cycle AC. Forty-five KW of 110V, single phase, power forwarded through a transformer bank.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - A UHF direction measuring equipment has already been installed and operated. Radar (SPS-46), magnetic, and gyrocompasses will be installed in the future.

Communication - Will be equipped as required for whatever work is in progress.

Echosounders - None as yet.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

None as yet.

## **ACOUSTICAL CHARACTERISTICS**

Not measured as yet.

## LABORATORIES

The electronics space has provision for installation of equipment equivalent to 12 - 5 ft. relay racks; there are 4 bays of 3 relay racks each with a 4 ft. separation between the inner 2 bays and 2 ft. separation between each inner and outer bay. Bays are accessible in the horizontal position for loading and checking out equipment. The work bench is accessible only in the vertical position. Dimensions of the electronics laboratory are about 25 x 14 ft. in the vertical and 20 x 8 ft. in the horizontal. 110 AC is provided, 250 lbs. compressed air can be made available. There is no air-conditioning as yet but it is planned for future installation.

## HABITABILITY

Nominal endurance two weeks in vertical position without re-victualing, exclusive of horizontal towing time to station. Range dependent on capability of towing vessel. Living quarters for six are available in both the horizontal and vertical positions. In each position there is over 300 sq. ft. of living space. Accommodations include fresh water shower, bunks, bathroom, electric range, freezer, sink and mess table, all of which are trunnioned for use in both the horizontal and vertical positions. It is equipped only for operating in temperate zone. Carries 3,500 gals. fresh water; no distillation capacity.

## OTHER FEATURES

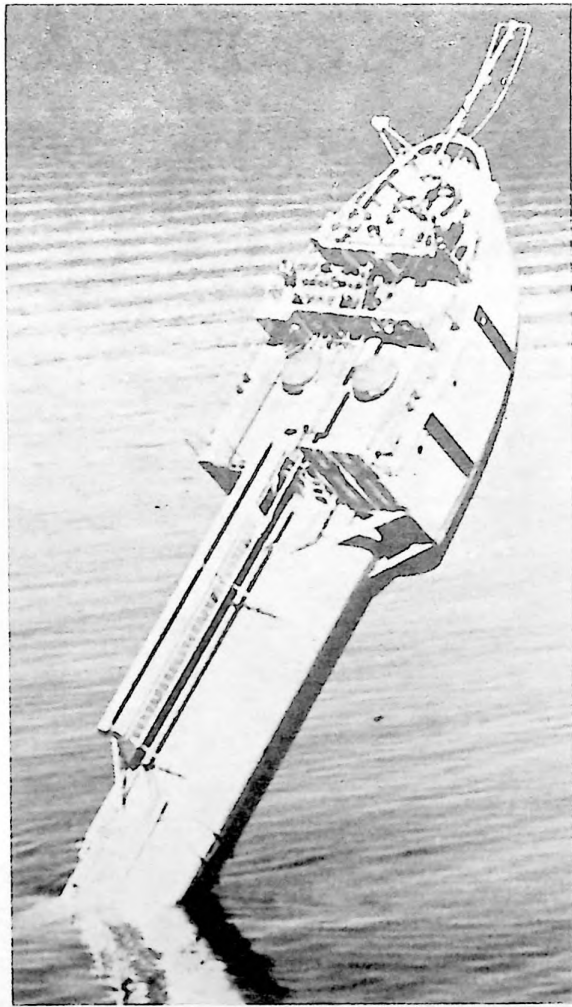
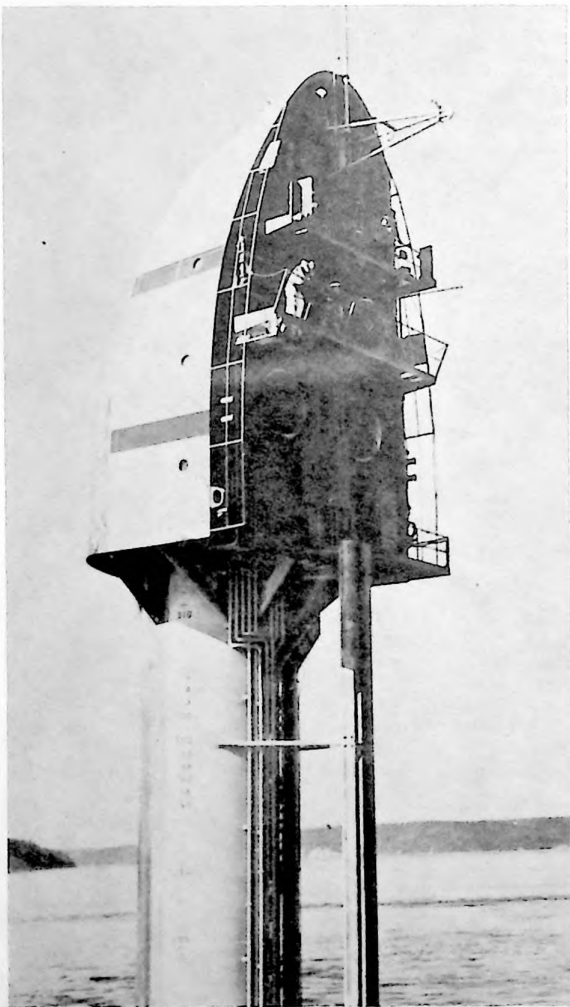
FLIP has great stability in vertical position in which vertical motion of buoy is approximately 10% or less than the surface wave motion. FLIP has a natural response period of 27 seconds when trimmed to the normal 300 ft. vertical draft. The deep vertical draft means that instrumentation can be rigidly fixed well below the surface while scientific personnel can remain above the surface. The stability and comfortable electronics and living quarters make possible experimental work that was previously masked by ship motion or impaired by the effect of ship motion on personnel. Personnel access to 150 ft. below the surface is available but at present is not being used. No personnel access within the hull of FLIP is available or possible below 150 ft. without the use of diving equipment.

## TYPE OF OBSERVATIONS

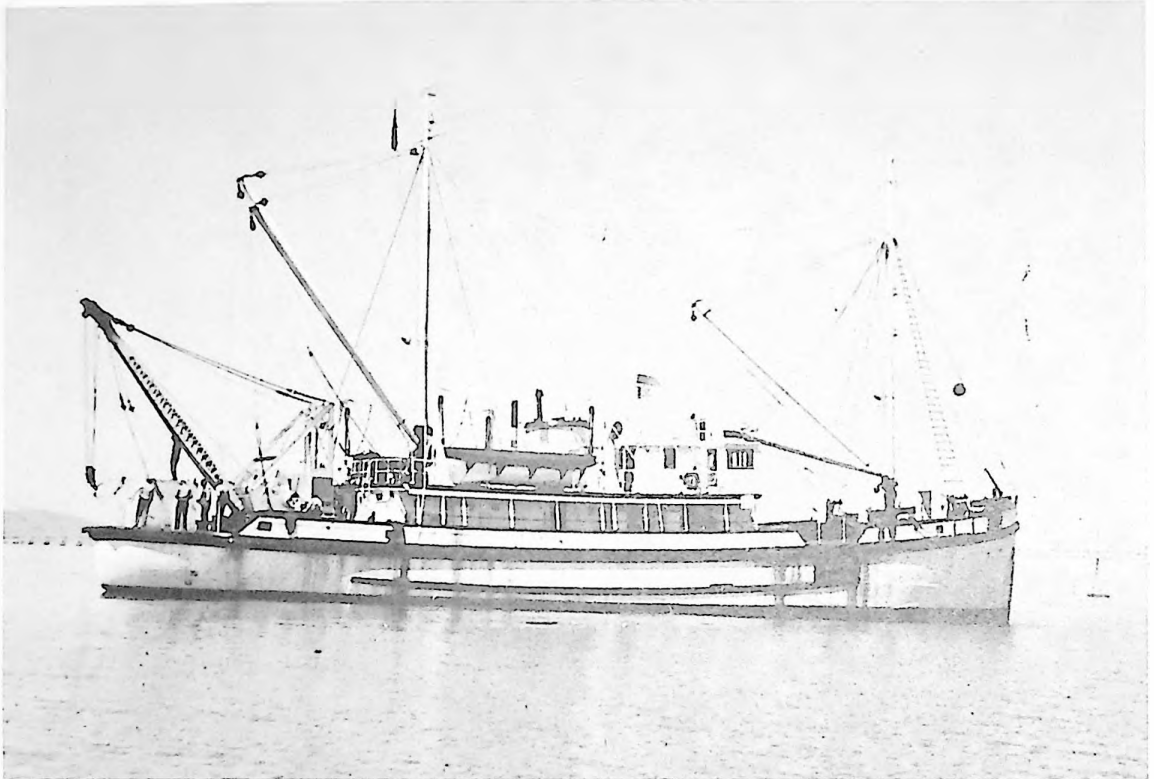
Though intended originally for studies of acoustic propagation with the hydrophone boom the full possibilities of its use have yet to be explored.

## REMARKS

The name describes the function of the manned ocean buoy FLIP which is to provide a stable platform from which to make measurements at sea; it also describes its unique operational feature which is to flip from the horizontal towing position to the vertical operating position and back again by flooding and blowing ballast tanks. Extreme beam 50 ft. due to hydrophone outriggers at the stern (i.e., bottom). Without these, maximum beam is 25 ft. at the bow section, 20 ft. in the cylindrical section. Drafts: Horizontal towing position is 13 ft. 8 inches aft and 8 ft. 10 inches forward. Vertical operating position is nominally 300 ft. but this can be varied  $\pm 10$  ft. depending on sea conditions. Displacement: Light ship, 574.0 long tons; horizontal towing, 1,500 long tons; vertical operating, 2,200 long tons. Horizontal it can be towed at 11 knots in good weather. Drifts with current in vertical position. Can be towed very slowly when vertical.



# FRED D. PARR



**TYPE:** General Cargo Carrier sheathed with iron bark for operations in ice.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1943	148'	33' 3"	14' loaded	1,002 tons	544	330

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
11	12.5			

## COMPLEMENT

CREW	SCIENTIFIC STAFF
16	12

## **AFFILIATION**

Ocean Transport Company (O.T.C.). Parr-Richmond Terminal Company, Bulk Terminal, 767 So. 4th St., Richmond, California.

## **PROPULSION**

One 875 HP Fairbanks Morse diesel engine, 5 cylinders, direct drive. Fuel consumption at 10 knots is 20 gal./hour, at 11 knots about 35 gal./hour.

## **ELECTRICAL POWER**

Has two 60 HP Fairbanks diesel 40 KW (each) generators, air starting; one 25 KW Barco generator, tailshaft driven; one 10 HP F/M diesel and a 5 KW generator.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Radar RCA Model CR 107-A, range 32 miles, Bludworth radio direction finder.

Communication - Apelco, 8 bands, incl. intership, ship to shore and emergency.

Echosounding - Fathometer, Bludworth, 200 fms.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Heavy lift derrick/winch independently powered by GM 6-71 diesel engine. Winch drum is oversized with 8,000 ft. of 7/8" improved plow steel wire rope. Lifting capacity 15 tons with safety factor of 5. Forward hatch has 2 booms and 2 winches with safe working load of 2 1/2 tons. Aft hatch has 2 booms and 2 winches, with safe working load of 1 1/2 tons.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Forward and aft cargo holds could be converted to research laboratories.

## **HABITABILITY**

Steam heat. Hot and cold running water.



### OTHER FEATURES

Hull strengthened for ice operations. All timbers, planking, decking and housing are heavy fir; great structural strength has been obtained by use of wood and steel knees, keelsons and ceiling.

### TYPE OF OBSERVATIONS

Oceanographic survey, waste disposal operations, construction projects, and salvage operations.

### REMARKS

Vessel may be chartered to undertake oceanographic research and marine survey.



# GERONIMO



**TYPE:** Former U. S. Navy ATA 207. Converted steel Seagoing Tug.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1945-built 1962-con- verted	143'	33'10"	11'for. 13'6" aft	603 tons (lighð 842.4tons (full)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
10	12.5	0.5	9,000 miles	30 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
15	10

## **AFFILIATION**

Department of Interior, Fish and Wildlife Service, Bureau of Commercial Fisheries, Biological Laboratory, U. S. Naval Station Annex, Bldg. 74, Washington 25, D. C.

## **PROPULSION**

Diesel electric engine, 1500 SHP, with single fixed-blade propeller.

## **ELECTRICAL POWER**

Main engine 1,200 KW. Auxiliaries, total 180 KW, 115V DC. Available for scientific use, 10 KW 115V AC 60-cycle and 30 KW 115V DC.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass, magnetic compass, radar, loran, and sonar (Simrad asdic).

Communication - Collins KWT-8 type 5, SSB transceiver and Ray 85-X radiotelephone.

Echosounders - UQN and Simrad white line recorder.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Hydrographic winch with 30,000' of 5/32" wire, plankton winch with 2,000' of 1/4" wire, BT winch, trawling winch 2-drum with 36,000' of 7/8" cable each.

## **ACOUSTICAL CHARACTERISTICS**

Vessel is noisy.

## **LABORATORIES**

Two laboratories, both air-conditioned, one for chemistry (130 sq. ft.) and a wet and dry laboratory (275 sq. ft.).

## **HABITABILITY**

Cannot work at poles, fine for tropics. Fresh water storage 28,000 gal.; distillation capacity 1,000 gal./day. Salt water showers are available but unnecessary.

### OTHER FEATURES

Bottom trawling to 500 fm., bottom dredging to 700 fm., scientific freezer, bilge keels installed. Vessel can operate to Beaufort 6.

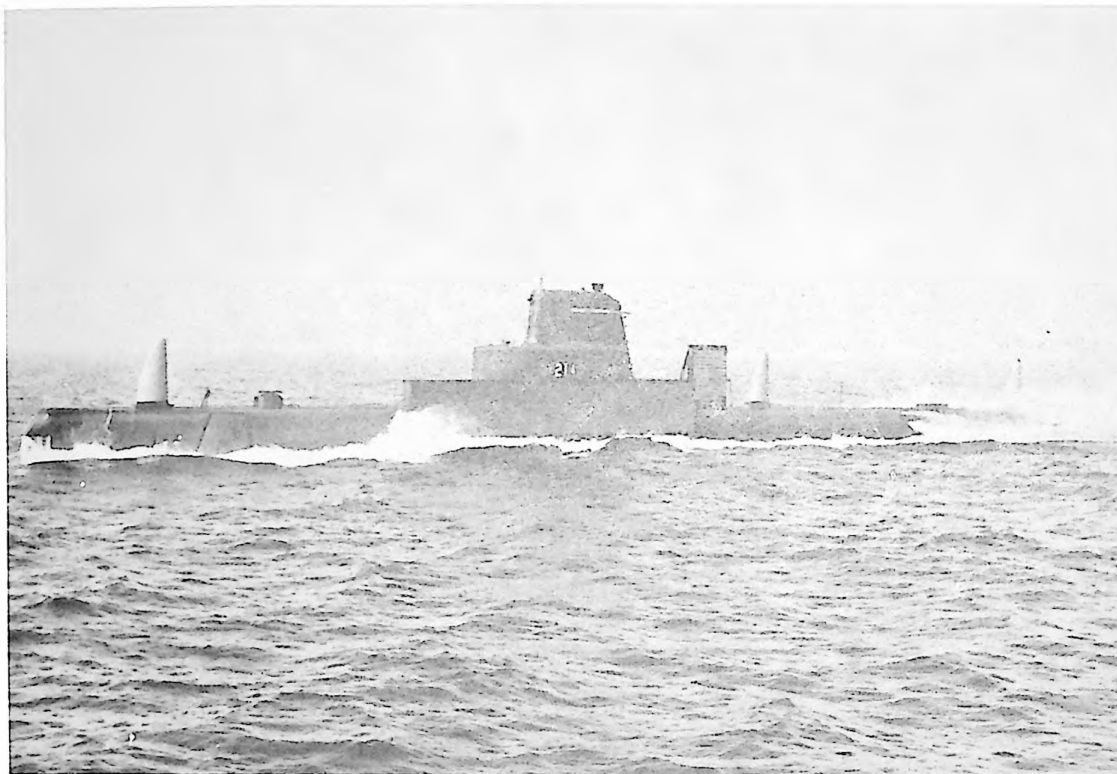
### TYPE OF OBSERVATIONS

Hydrographic casts, bottom sampling, dredging, bottom trawling, midwater trawling, long-line fishing, live-bait tuna fishing, zoo-plankton tows.

### REMARKS

Two women scientists can be accomodated. Named after Apache Indian chief who fought valiantly against the U. S. Army.

## GROUPE



**TYPE:** Submarine, AGSS-214, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1942	307'	27'	17'	1,859 normal 2,417 submerged		

### PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
10	12		10,000 miles	60 days

### COMPLEMENT

CREW	SCIENTIFIC STAFF
73	15 officers

## **AFFILIATION**

U.S. Navy, Unit of ComSubLant under operational control of ComSubRon Two, U.S. Naval Submarine Base, New London, Connecticut.

## **PROPULSION**

Diesel electric, two four-bladed bronze Prairie screws. Fuel capacity 119,000 gal. Navy diesel.

## **ELECTRICAL POWER**

AC Power: three 35 KVA 60 c.p.s., two 5 KVA 400 c.p.s., one 1 KVA 400 c.p.s., and one 150 KVA 60 c.p.s., also 115V 60 c.p.s. 105 KVA, 115V 400 c.p.s. 11 KVA, and 440V 60 c.p.s. 150 KVA. Has 250V DC battery.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompasses, 1 Arma and 1 Sperry; Magnesyn compass; electromagnetic log; radar; underwater telephone; sonar; loran.

Communication - Radio transmitters and receivers which cover VLF to UHF frequencies.

Echosounders - AN/UQN fathometer scales: 100 ft. to 100 fms. and 400 ft., 400 fms., and 4,000 fms.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Not applicable.

## **ACOUSTICAL CHARACTERISTICS**

Ship especially equipped for acoustical work.

## **LABORATORIES**

Has several specialized electronic laboratories. Her forward torpedo tubes have been removed and considerable amount of specialized electronic equipment has been installed.

## **HABITABILITY**

Air-conditioned. Carries 8,800 gal. fresh water.

## **OTHER FEATURES**

None.

## **TYPE OF OBSERVATIONS**

Carries out experiments and research for the Underwater Sound Laboratory.

## **REMARKS**

Named for a fish of warm seas. Chief of Naval Operations redesignated the USS GROUPER as an AGSS in 1958. Since then, considerable funds have been invested to outfit her as an underwater research vehicle.

# G. W. PIERCE



**TYPE:** Converted U. S. Navy MSCO, wooden hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1942	136'	25'	9'	350 tons full 270 tons light	233	159

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
10	11.5	3	1,300-2,000 mi.	6 weeks

## COMPLEMENT

CREW	SCIENTIFIC STAFF
12	10



## **AFFILIATION**

Marine Acoustical Services, Inc., 1975 N.W. South River Drive,  
Miami 35, Florida.

## **PROPULSION**

Twin diesels controlled from engine room or bridge, twin screws, 500 HP each. Uses #2 diesel oil or gasoil.

## **ELECTRICAL POWER**

Ship generates 150 KW DC and 30 KW AC. Ship requires 40 KW DC, 5 KW AC for normal operation. Available for scientific equipment 90 KW DC, 25 KW AC.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Sperry Mark XIV gyrocompass with repeaters, magnetic compasses (2), Decca 838 radar, Sperry loran, Sperry automatic steering.

Communication - Apelco R/T, frequency 2-5 MC, A3 emission, 250W; TCZ transmitter, frequency 0.2-18.1 MC, A1 A2 A3 emission, 20-90W; HQ-180 Hammarlund receiver, frequency .54-30 MC, A1 A2 A3 SSB emission; TCS-12 receiver, frequency 1.5-12 MC, A1 A2 A3 emission; TCS-12 transmitter, frequency 1.5-12 MC, A1 A2 A3 emission, 15-25W; Johnson Viking R/T (2 units), frequency 27 MC CB, A1 A3 emission, 5W; RBL-5 receiver, frequency 15-600 KC, A1 A2 A3 emission. Single-sideband transmitting equipment is on hand and may be installed as required.

Echosounders - NMC fathometer with precision 60-cycle power supply (with 19" precision graphic recorder as needed). Fairway depth indicator (0-50 ft., 0-50 fms.).

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

BT winch, winches equipped with slip rings for use with sound-velocity measuring apparatus, and winches suitable for coring and bottom sampling. A large hydraulically controlled winch with capacity of 50,000 lbs. hauling strain is on board. This winch will accommodate 8,000 ft. of 1" cable, 32,000 ft. of 1/2", or proportionate amounts of cable of other sizes. Level wind ratios will permit use of cable of the following diameters: 3/8", 1/2", 3/4" and 1".

## ACOUSTICAL CHARACTERISTICS

Noiseless condition can be sustained for at least 24 hours.

## LABORATORIES

One laboratory on main deck (14' x 14'), with AC and DC current and compressed air. Room on the engine room hatch aft of main laboratory for portable laboratory. Company has available a portable air-conditioned laboratory (8' x 10') which may be placed aboard most of its vessels.

## HABITABILITY

Laboratory and berthing spaces are air-conditioned, but not heated. Fresh water capacity is 2,600 gal. Distriller with 1,000 gal./per day capacity.

## OTHER FEATURES

Equipped with portable engine control device which permits vessel to be conned from any position topside. No antirolling devices. Ship can operate up to Sea State 4.

## TYPE OF OBSERVATIONS

BT, continuous surface temperature, echo sounding to 4,000 fms., deep sea buoy planting up to 3,800 fms., sound velocity, Nansen cast, precision bottom contour.

## REMARKS

Carries a 16 ft. Boston Whaler with outboard motors. Named after scientist who made important contributions in the fields of communication engineering, electrical resonance and waves, liquid diffusion and supersaturation, resonance in wireless telegraphy circuits, measurements of sound intensity, piezoelectric crystal and magnetostriction oscillators and submarine detection. Salt water showers are installed but not generally used because of adequate distillation capacity. Galley capable of preparing meals for 60 people. Space could be provided for 2 women scientists.

## HAROLD W. STREETER

NO PHOTO AVAILABLE

**TYPE:** Wood hull, designed for oceanographic research by Edwin Monk, Seattle.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1962	45'	14'	6'			

### PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
8	10	2		

### COMPLEMENT

CREW	SCIENTIFIC STAFF
1	5

## **AFFILIATION**

Built for U.S. Public Health Service in 1962 for use in oceanographic research.

## **PROPULSION**

Rebuilt G.M. 64-HN9 6-71 diesel; 105 HP fitted with 3-1 reduction gear and 25 HP front end take off. Fuel capacity 600 gal.

## **ELECTRICAL POWER**

Has 32V service supply; ONAN mod. 6 MDJB 3 R water cooled, 6 KW 120/240V single phase generator.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Decca Mod. 303 radar; two 6" magnetic compasses; Miller Freeman non-hunting auto pilot.

Communication - Has 32V Apelco AE-95 M2, 100W input radiotelephone.

Echosounder - Simrad Mod. 512-11W white line recorder.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Two hydraulic level-wind winches; 1,000 ft. with 5/32" cable each; two 1-ton booms.

## **ACOUSTICAL CHARACTERISTICS**

Cannot be operated in noiseless condition. Values for radiated and internal noise levels not available.

## **LABORATORIES**

One two-man laboratory; two sinks; electrical power - 110/220V.

## **HABITABILITY**

Limited to trips of two to three days in Puget Sound and coastal waters. Fresh water capacity - 200 gal. Sleeps six.

## OTHER FEATURES

Hydraulic anchor winch and hydraulic steering in pilot house and flying bridge. Uses keel stabilizers, fitted for outrigger stabilizers.

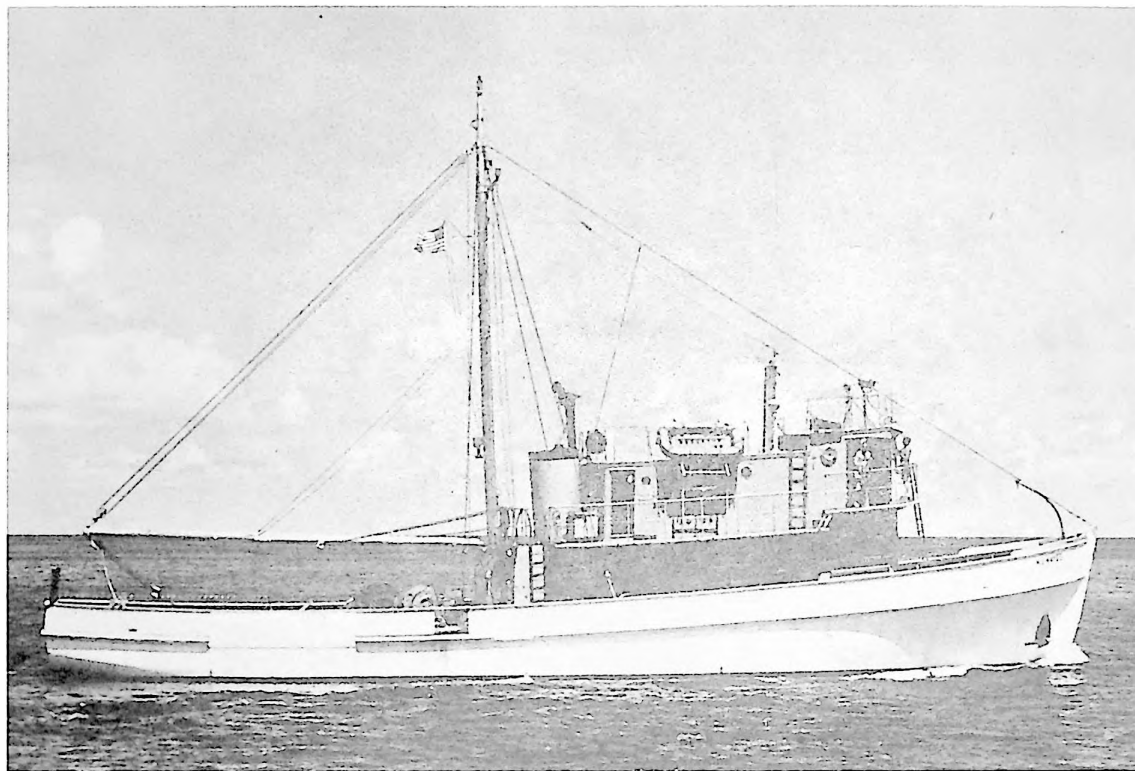
## TYPE OF OBSERVATIONS

Hydrographic casts, light coring, hydrography dredging, trawling, and current meter work.

## REMARKS

Vessel launched December 22, 1962. Expected to be fully operational by January 15, 1963.

# H. C. HAYES



**TYPE:** Converted YDT, wooden hull, steel framed.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1941	98'	22'	7'6" mean 3' full	70 tons	157	106

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
9	9	3	1,100 to 1,300 miles	3 weeks

## COMPLEMENT

CREW	SCIENTIFIC STAFF
8	3

## **AFFILIATION**

Marine Acoustical Services, Inc., 1975 N.W. South River Drive,  
Miami 35, Fla.

## **PROPULSION**

Diesel engine (direct drive), single propeller, 400 HP. Uses #2 diesel or gasoil. Portable fuel tanks may be installed to increase range to 1,300 miles with 20% reserve at 9 knots. Range with ship's tanks only is 1,100 miles with 20% reserve at 9 knots.

## **ELECTRICAL POWER**

Ship generates 80 KW DC, 2 KW AC, and 5 KW AC. Normal ship operations require 40 KW DC. Available for scientific work 40 KW DC and 7 KW AC. Characteristics: 120V DC, 80 KW; 120V AC, 60-cycle, single-phase.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Raytheon pathfinder radar 25 KW X-band (CX-1128).

Communication - Apelco R/T, 2-5 MC, 250W, A3 emission; Pierce Simpson R/T, 2-5 MC, 72W, A3 emission; RAO-7 receiver, 1.54 to 13 MC, A1 A2 A3 emission; TCS-12 receiver, 1.5-12 MC, 15-25W, A1 A2 A3 emission.

Echosounders - Raytheon depth indicator DE 116 (0-360 ft.).

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Four drum winch installed on main deck aft. Inboard drums have capacity of 360 ft. of 5/7" wire; outboard drums have capacity of 1,800 ft. of 1/2" wire. Each drum has pull of 3,000 lbs. simultaneously or total of 12,000 lbs. pull. BT winches, winches equipped with slip rings suitable for sound velocity measuring apparatus, and winches capable of coring and bottom sampling. These are available according to requirements of user.

## **ACOUSTICAL CHARACTERISTICS**

Capable of noiseless condition for 24 hours and longer with modifications. Time limited by need to maintain refrigerator temperatures.

## **LABORATORIES**

One laboratory (8' x 10') on bridge deck. Airconditioned. Both AC and DC available.

## **HABITABILITY**

Ship not heated. Has 3,000 gal. fresh water capacity.

## **OTHER FEATURES**

No antirolling devices; can operate up to Sea State 4. Carries 13 1/2 ft. Boston Whaler with outboard that may be radio equipped.

## **TYPE OF OBSERVATIONS**

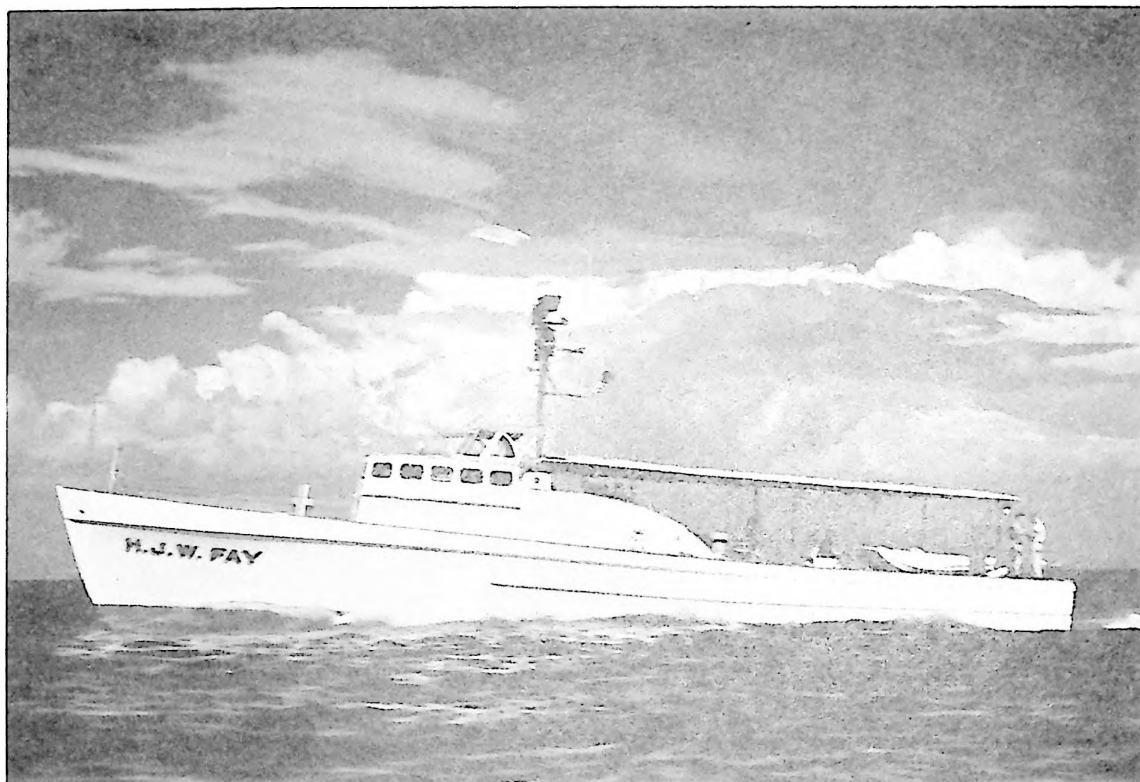
Nansen casts, BT, continuous surface temperature and sound velocity.

## **REMARKS**

Berthing for 11 men; three bunks on main deck level, six bunks in compartment on 01 deck, two bunks in private stateroom can house two women scientists on 01 deck. Named after scientist largely responsible for research and development program in underwater sound techniques at the Naval Research Laboratory.



# H. J. W. FAY



**TYPE:** Converted Navy Patrol Boat, wooden hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1943	83'	17'	4'6" mean 5'6"full	53 tons	70	47

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
15	18	3	440 miles	2 weeks

## COMPLEMENT

CREW	SCIENTIFIC STAFF
3	5

## **AFFILIATION**

Marine Acoustical Services, Inc., 1975 N.W. South River Drive, Miami 35, Florida.

## **PROPULSION**

Twin diesel, two propellers, 600 HP each shaft. Uses #2 diesel or gasoil.

## **ELECTRICAL POWER**

Ship generates 20 KW AC, normal ship operation requires 12 KW AC, 8 KW AC available for scientific equipment. Has 240/120V AC, single-phase.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Fairway depth sounder (0-50 ft., 0-50 fms.). Winston depth sounder (0-12 ft., 0-120 ft.), magnetic compasses (2), Decca 404 radar with variable range marker.

Communication - Pierce Simpson R/T, frequency 2-5 MC, 65W, A3 emission.

Echosounders - Winston depth indicator (0-12 ft., 0-120 ft.)

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

BT winches and winches equipped with slip rings suitable for use with sound velocity measuring apparatus. Other winches are available for installation.

## **ACOUSTICAL CHARACTERISTICS**

Capable of noiseless condition for at least 24 hours.

## **LABORATORIES**

Small room (4' x 6') suitable for electronics laboratory.

## **HABITABILITY**

Vessel not heated or air-conditioned. Fresh water supply 300 gal. Distiller with 150 gal./day capacity.

## OTHER FEATURES

No antirolling devices. Can operate to Sea State 3.

## TYPE OF OBSERVATIONS

BT, continuous surface temperature, sound velocity and Nansen cast.

## REMARKS

Vessel is used primarily as courier and logistic support for research vessels and stations. Carries a 13.5 ft. Boston Whaler with outboard motors. Vessel can accommodate 2 women scientists. Named after a former president of the Submarine Signal Company, who was responsible for the development of underwater sound techniques during the period between World War I and World War II.

# JAMES M. GILLIS



**TYPE:** AGOR-4, designed as a deep sea Oceanographic Research Ship, steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1962	209'	39'	15'	1,370 tons		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
12	15	0	12,000 miles	60 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
23	15

## **AFFILIATION**

Operated by Military Sea Transportation Service under technical control of the U. S. Naval Oceanographic Office.

## **PROPULSION**

The main propulsion diesel electric plant consists of two marine main propulsion engines capable of developing a minimum of 600 HP each at rated r.p.m. each connected directly to a propulsion generator. The two direct current generators furnish power to drive one direct current double-armature propulsion motor connected to a single shaft with a 9 ft. diameter propeller. This motor is rated at 1000 SHP at 200 r.p.m. Has a bow propulsion system consisting of a gas turbine driven direct current generator connected to a direct current bow motor geared to a 3 ft. diameter propeller. This bow propulsion unit is designed so that the bow propeller may be trained to either port or starboard to assist in maneuvering the ship when "on station."

## **ELECTRICAL POWER**

Three main ship service diesel driven generators are provided rated at 200 KW max., 450V, 3-phase, 60-cycle. A standby ship service generator is rated at 150 KW max., 450V, 3-phase, 60-cycle. Batteries provide power over the range of 117 KW, 99V, 1,180 amps. for 1/2 hr. to 4 KW, 121V, 36.5 amps. for 48 hrs. Two AC/DC-DC/AC ship service generators are installed capable of operating so that either the AC unit or the DC unit may be used as the driving unit, either to provide DC power to the DC system from the AC unit or to provide AC power to the ship service AC system from the DC unit. These are to be used for ultra-quiet operation of the electric plant and battery charging. The DC unit is capable of driving the 20 KW AC generator when the DC motor is operating at 80V. The range of voltage of the DC unit when it is operating as a motor is 80-175V. The AC unit when acting as a generator, generates 20 KW. The voltage of this unit as a generator is 450V AC, as a motor 440V AC. Two 2 KW, 120V, 3-phase, 400-cycle output, 440V, 3-phase, 60-cycle input AC/DC motor generators are provided for operating the gyrocompass system and gravity meter; frequency and voltage are regulated to  $\pm 5$  percent. All motor generators are installed with sound and vibration isolation mounts.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - LORAN C and RDF. Raytheon Mariners Pathfinder radar and 2-30 MC Collins Mod 5-114 receiver.

Communication - The ship can receive and transmit on 350-600 KC and 2-24 MC, 2-9 MC, and 3-15 MC units. The ship also has one national

entertainment type radio receiver. Remote facilities are available in the dry laboratory for SSB and transceiver operations. The ship can receive various facsimile broadcasts.

Echosounders - EDO AN/UQN-1, and PGR type sounders are to be installed.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Two hydraulic hydrographic winches with a wire capacity of 30,000 ft. of 3/16" 6 X 19 improved plow steel cable are provided; these winches are capable of lifting 2,000 lbs. on the average layer at 350 ft./min. A watertight metering device is installed which has a range of 1-10,000 m. The spooling device is designed to accommodate 3/16" and 3/8" cable. An electrical continuity device is provided to accommodate 8 conductor electrical cable. The drums are interchangeable. These winches are mounted on the 0-1 level in such a position that they both will feed through sheaves on the main hydrographic davit. A storage and inspection winch is provided which has a drum that is interchangeable with those of the two hydrographic winches. Has two Navy model E-6/S BT winches. Western Gear Corporation deep sea anchoring and coring winch with a capacity of 45,000 ft. of 3/8" to 3/4" tapered wire. The traction unit for this winch can retrieve cable under 6,800 to 30,000 lbs. tension at 600 to 133 ft./min. respectively. The davit for this unit is mounted at the stern, main deck; the wire stowage unit is installed below the main deck. Space and power are available on the 01 level for installation of two small electrical cable winches. Space and power are available for installing a large articulated winch near the stern, main deck. One capstan carpuller installed on the 0-1 level has a maximum line pull of 2,000 lbs. at 50 ft./min. Two vertical capstans installed on the main deck aft each have a line pull of 5,000 lbs. at 40 and 20 ft./min. A crane with 46 ft. boom outreach on the main boom using a two part purchase to 3 tons with a 60 ft. outreach using the jib with a two part purchase.

## **ACOUSTICAL CHARACTERISTICS**

All rotating and reciprocating machinery is installed on sound isolation mountings.

## **LABORATORIES**

Dry laboratory, wet laboratory, scientific and chart room, photo laboratory, scientific drafting room and scientific office are provided with adequate work benches, sinks and storage bins for normal operations. A machine shop equipped for general work is also provided. Instrument racks are available for use in the dry laboratory.

## **HABITABILITY**

All living and working spaces except the wet laboratory are air-conditioned.

## **OTHER FEATURES**

Two 24" diameter tubes located along the center line open to the sea; one is located forward with access from the main deck, the other is about at midships which is accessible from the 0-1 level. These are to be used for lowering specialized scientific gear. Space is available for an electronic instrument van to be located on the 0-1 level. One 10" diameter sea chest is installed near the keel, amid ships for installation of special transducers or other gear. Space is available for stowage of 20 tons explosives. A 40 cu. ft. freezer is installed in the wet laboratory.

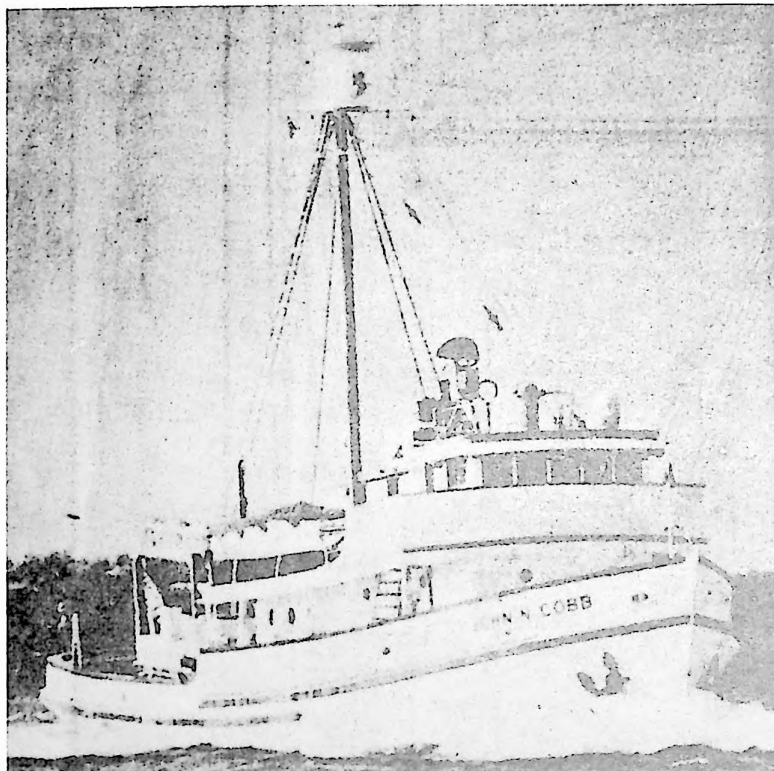
## **TYPE OF OBSERVATIONS**

The ship is well-fitted and large enough to make practically all types oceanographic and marine geophysical observations, including classical physical and chemical oceanographic, electronic (automatic and semi-automatic recording) oceanographic, bottom sampling and stereo photographic, sub bottom profiling, hydrographic, biological sampling, magnetic, and gravimetric measurements.

## **REMARKS**

This ship is the first newly constructed TENOC ship to become fully operational; facilities are available for women scientists. It is equipped for practically all types of marine geophysical and oceanographical observations. Other AGORs' of similar design include the ROBERT D. CONRAD (AGOR-3) and the CHARLES H. DAVIS (AGOR-5).

# JOHN N. COBB



**TYPE:** Fishing Boat, wood hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1950	93.4'	25.6'	12.8'		250	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
10	10 3/4		6,000 miles	20 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
10	4



## **AFFILIATION**

Fish and Wildlife Service, Bureau of Commercial Fisheries, Exploratory Fishing Office, 2725 Montlake Boulevard, Seattle, Washington.

## **PROPULSION**

Fairbanks Morse diesel, 8 cylinders, 345 HP at 375 r.p.m. with single fixed-blade propeller. Carries 45 tons of fuel oil.

## **ELECTRICAL POWER**

Has 110V and 220V AC from two 45 HP GM diesel generators.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Sperry radar 30W; Sperry loran.

Communication - Northern Radio, 250W, and Northern Radio 150W.

Echosounders - Bendix, 30 KC, 2,400 ft. range and Simrad, 30 KC, 6,600 ft. range. Also has asdic, Minneapolis Honeywell "Sea Scanner," 175 KC, 1,600 ft. range.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has electric hydrographic winch with 3,600 ft. of cable and a two drum Rowe-west coast trawl winch with 6,000 ft. of cable.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Has 120 sq. ft. of laboratory space.

## **HABITABILITY**

Carries 25 tons of fresh water.

### **OTHER FEATURES**

Has refrigeration equipment.

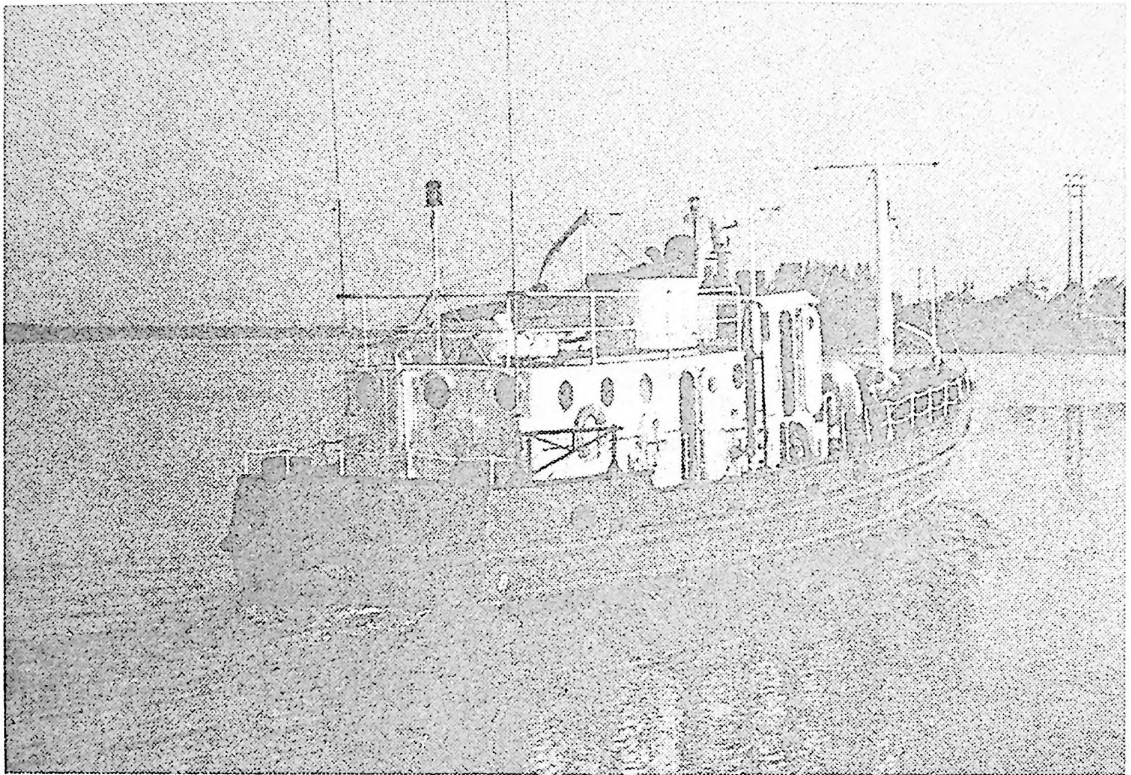
### **TYPE OF OBSERVATIONS**

BT, water samples, bottom samples, dredging and plankton tows.  
Primarily used for fisheries research and biological observations.

### **REMARKS**

Generally works in the northeast Pacific. Moderately good sea-kindliness.

# KYMA



TYPE: Research ship.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
	65'	17'				

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
	12		500 miles	

## COMPLEMENT

CREW	SCIENTIFIC STAFF

## **AFFILIATION**

Owned by the Office of Naval Research and operated by New York University, Department of Oceanography and Meteorology.

## **PROPULSION**

Powered by a 270 HP diesel engine.

## **ELECTRICAL POWER**

Has a 20 KW AC auxiliary diesel generator.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Loran, radar.

Communication - Two ship-to-shore radios.

Echosounders - Raytheon with two recorders.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Bathythermograph winch and boom. An oceanographic winch, A-Frame, and platform is expected to be added during the early part of next year.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Former cargo space converted to an oceanographic-instrumentation laboratory.

## **HABITABILITY**

No information.

## **OTHER FEATURES**

No information.

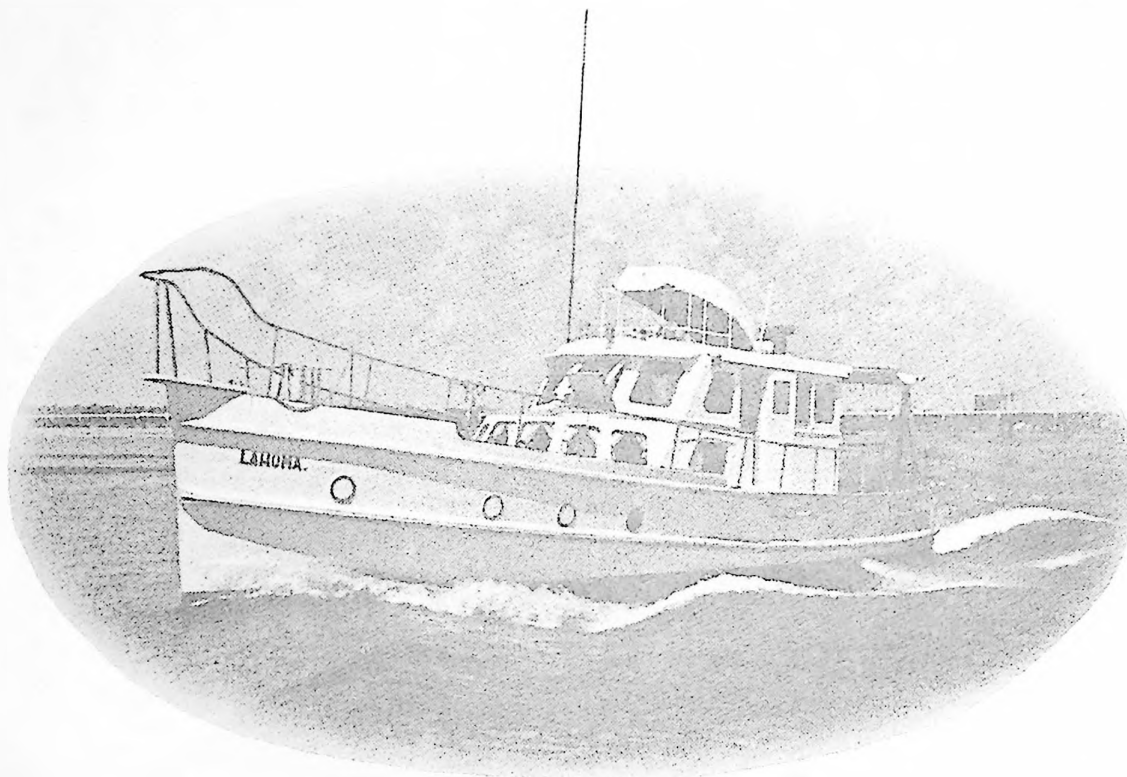
## TYPE OF OBSERVATIONS

Investigation of bottom pressure fluctuations due to wave action, radiation balance, including incident and reflected short-wave radiation, turbulence, and surface-wind patterns at selected levels within a 1-10 meter range above the sea surface, and standard oceanographic observations.

## REMARKS

KYMA is a Greek word meaning "waves". Vessel now uses docking facilities at the New York State Maritime Academy, but facilities are to be constructed on the Harlem River near the university.

# LAHOMA



**TYPE:** Cabin Cruiser.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
	50'	13'	4'		19	14

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
	10		1,400 miles	

## COMPLEMENT

CREW	SCIENTIFIC STAFF
6 (total)	

## **AFFILIATION**

Marine Exploration Company Incorporated, 561 W. 35th Place, Hialeah, Florida.

## **PROPULSION**

Has 225 HP diesel engine.

## **ELECTRICAL POWER**

Has 1.5 KW, 32V DC auxiliary power.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - No information.

Communication - Has 100W ship-to-shore radio.

Echosounders - No information.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

No information.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

No information.

## **HABITABILITY**

Sleeps six.

## **OTHER FEATURES**

Air compressor: 125 lbs./sq. in., 25 cu. ft. Special devices, important to underwater research and recovery, include complex electronic equipment available when needed. Has standard diving equipment and a 12 ft. outboard tender.

## TYPE OF OBSERVATIONS

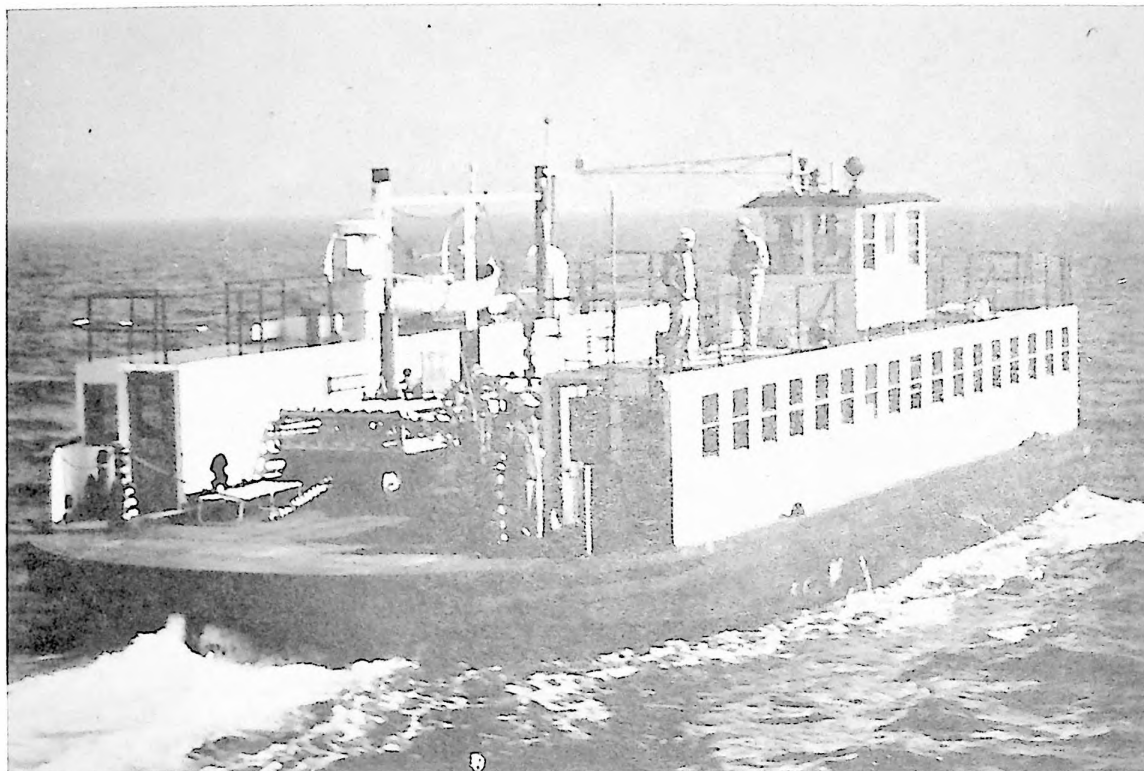
Underwater research and exploration.

## REMARKS

Generally engaged in salvage and treasure explorations around the Florida Keys and in the Caribbean. Recently, ship's principal interest has been in the field of underwater research (oceanography).



# LANGLEY



TYPE: Steel hull converted Ferry Boat.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1952	76'4" (overall)	32' (extreme)	5 1/2'		109	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
6 1/2	7 1/2	1	500 miles	10 days

## \* COMPLEMENT

CREW	SCIENTIFIC STAFF
3	8

\* more for 1-day trip

## **AFFILIATION**

Virginia Institute of Marine Science; School of Marine Science, College of William and Mary. Located at Gloucester Point, Virginia.

## **PROPULSION**

Fairbanks-Morse diesel engine, 300 HP. There are two fixed blade propellers, one at each end as is standard aboard ferrys. Diesel No. 2 fuel oil, used for main engine and 5 KW generator unit.

## **ELECTRICAL POWER**

Normal generation, 5 KW 108/220V AC. Emergency power, 6V battery system. Auxiliary power, 25 KW 108/220V AC. Normal operation requires about 3 KW. Kilowatts available for scientific apparatus would be 3 KW when ship is running, with 25 KW auxiliary. Characteristics: 108/220V 60-cycle AC.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Magnetic compass, ship log, depth finder.

Communication - None

Echosounder - Raytheon (plus or minus 1 ft.)

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Two light winches and two heavy duty winches.

## **ACOUSTICAL CHARACTERISTICS**

No information except that it is an all-steel vessel.

## **LABORATORIES**

Wet and dry laboratories, no air-conditioning. Area, 200 sq. ft.

## **HABITABILITY**

Open bays and rivers in mid-latitudes only. Range, about 500 miles round trip. Endurance, about 10 days (vessel could be equipped for much longer endurance if the need arose).

### OTHER FEATURES

No distillation facilities. Present fresh water capacity 250 gals. Bow propeller. Can carry vehicles or laboratory trailers. No anti-rolling devices, vessel is inherently stable.

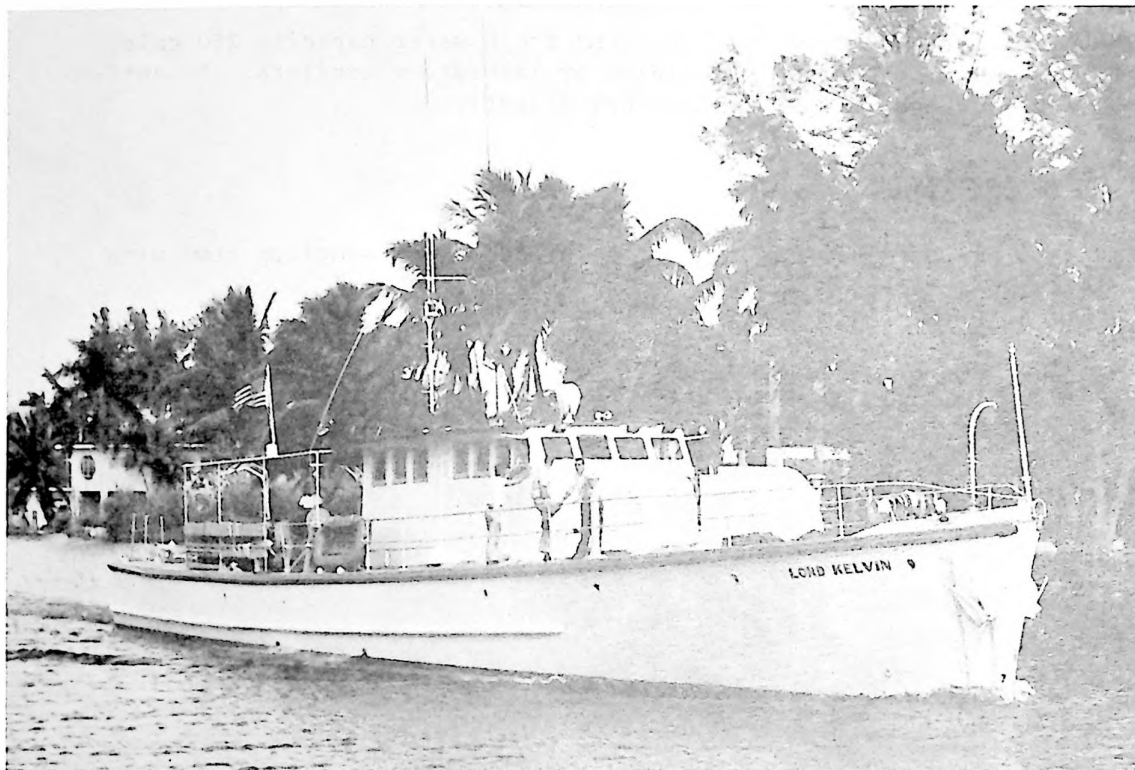
### TYPE OF OBSERVATIONS

Shallow hydrographic casts, coring, dredging and sampling tows with trawls, nets or Gulf III.

### REMARKS

Converted Ferry Boat donated to the Institute by NASA from Langley Field where it was previously used to ferry personnel to Wallops Island until a bridge replaced its services.

## LORD KELVIN



**TYPE:** Converted 110 ft. Subchaser, wooden hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1942	108.4'	18.3'	6.3'	71 tons	136	92

### PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
10	15	3	750 miles	3 weeks

### COMPLEMENT

CREW	SCIENTIFIC STAFF
8	4

## **AFFILIATION**

Marine Accoustical Services, Inc., 1975 N.W. South River Drive,  
Miami 35, Florida.

## **PROPULSION**

Diesel engine, twin screw, 500 HP each. Uses #2 diesel or gasoil.

## **ELECTRICAL POWER**

Ship generates 20 and 30 KW DC and 2 and 5 KW AC. Ship requires 25 DC and 2 AC for normal operation. Available for scientific equipment, 25 KW DC and 2 KW AC. Power characteristics: 120V DC, 5 KW and 120V AC, single-phase, 60-cycle.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Sperry Mark XVIII gyro with repeaters, magnetic compass.

Communication - Apelco R/T, frequency 2-5 MC, A3 emission, 250W; HQ-145X Hammarlund receiver, frequency .54-30 MC, A1 A2 A3 SSB emission; TCS-12 receiver, 1.5-12 MC, A1 A2 A3 emission; Johnson Viking 27 MC CB, A1 A3 emission, 5W.

Echosounders - Pierce Simpson, depth sounder (0-120 ft.)

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Depending upon requirements, various winches may be installed.

## **ACOUSTICAL CHARACTERISTICS**

Noiseless condition can be sustained for at least 24 hours.

## **LABORATORIES**

Area 10 x 10 ft. available for research equipment, equipped with benches for electronic equipment, fluorescent lighting, and numerous AC power outlets.

### **HABITABILITY**

No heating or air-conditioning. Efficient forced-air ventilation is provided. Fresh water supply 2,647 gal.

### **OTHER FEATURES**

No antirolling devices. Ship can operate up to Sea State 3.

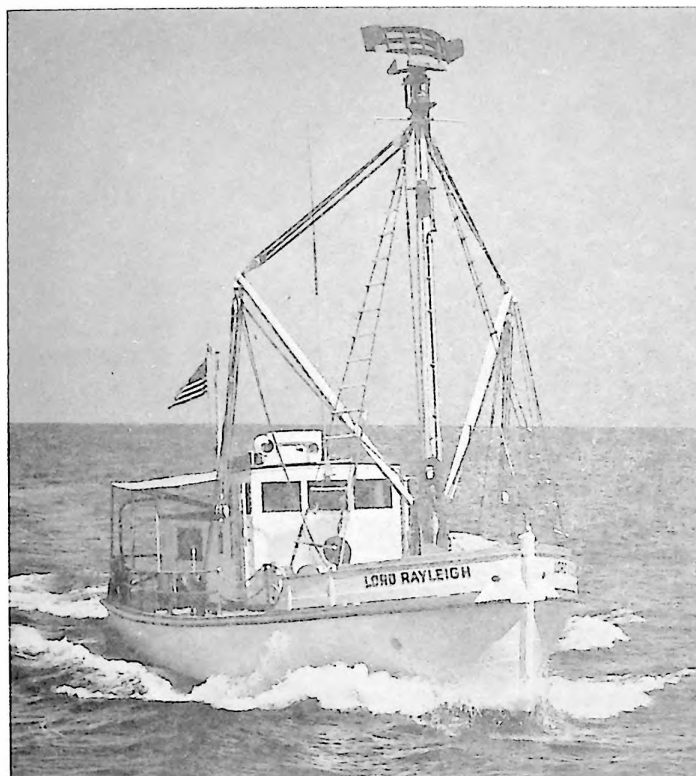
### **TYPE OF OBSERVATIONS**

BT, continuous surface temperature, sound velocity, Nansen cast.

### **REMARKS**

Carries 13.5 ft. Boston Whaler. Named after scientist who solved many problems of electrostatics. Women scientists can be accommodated. Ship used primarily as courier and logistic support for research vessels and stations.

# LORD RAYLEIGH



**TYPE:** Converted U. S. Army T-boat, wooden hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1944	65'	16'5"	6'6" aft	46.3 tons	48	32

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
9	10	4.5	850 miles	2 weeks

## COMPLEMENT

CREW	SCIENTIFIC STAFF
3	2

## **AFFILIATION**

Marine Acoustical Services, Inc., 1975 N. W. South River Drive,  
Miami 35, Florida.

## **PROPULSION**

Diesel engine, one propeller, 160 HP, uses #2 diesel or gasoil.

## **ELECTRICAL POWER**

Has 10 KW, 120/240V, 60-cycle, single-phase AC. Portable AC and DC generators can be placed on board. From battery sources 32V DC (450 amp.-hrs.) and 24V DC (200 amp.-hrs.).

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Magnetic compass, Decca radar 404M, loran APN-9. Wood Freeman auto-pilot and RCA direction finder AR-8712.

Communication - Pierce Simpson R/T, frequency 2-5 MC, A3 emission, 132W.

Echosounders - Bendix depth indicator D1-2 (0-100 ft.)

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

BT, and winches equipped with slip rings for use with instruments such as sound velocity measuring apparatus.

## **ACOUSTICAL CHARACTERISTICS**

Noiseless condition can be sustained for at least 24 hours.

## **LABORATORIES**

Laboratory space (14' x 14') in hold. After bunk room could be used as small laboratory.

## **HABITABILITY**

Vessel is air-conditioned. Fresh water supply 470 gal.



### **OTHER FEATURES**

No antirolling devices. Can operate to Sea State 3. Has 2 cargo booms forward.

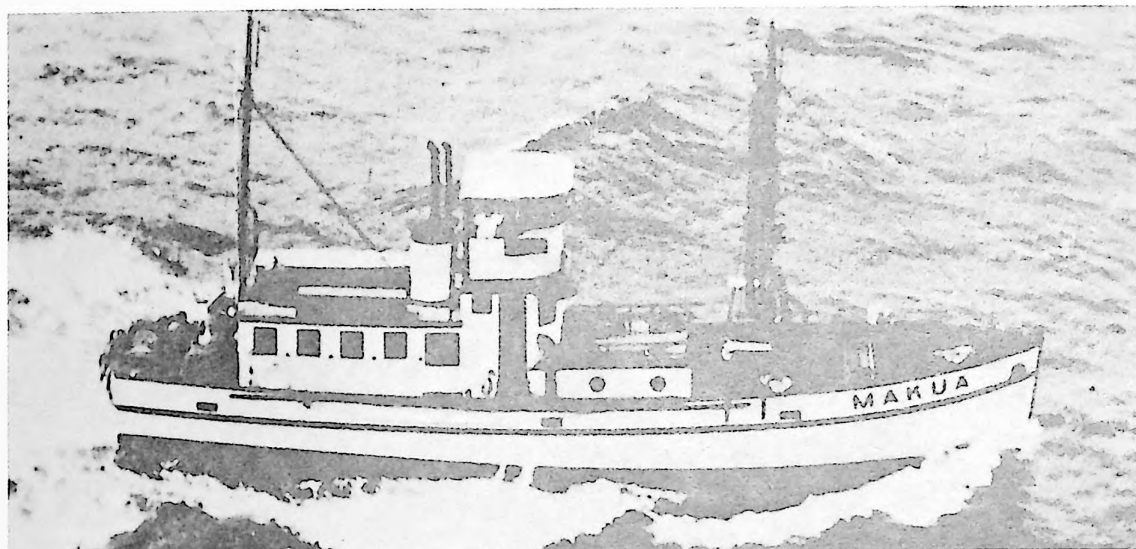
### **TYPE OF OBSERVATIONS**

BT, continuous surface temperature, sound velocity, Nansen cast.

### **REMARKS**

Ship named after noted British physicist known as "the father of mathematical acoustics," and Nobel prize winner in 1904.

# MAKUA



**TYPE:** Fishing Boat, wood hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1942	65'	16' 6"	6'		52.4	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
6	8		1,000 miles	1-5 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
2	6

## **AFFILIATION**

Fish and Game Division, Hawaii Department of Land and Natural Resources, Honolulu.

## **PROPULSION**

Has a 671 Gray main diesel engine, 165 HP, with a single fixed pitch propeller. Carries 1,000 gal. fuel oil.

## **ELECTRICAL POWER**

Has a 30 KW generator capable of producing 108V DC and 115V AC.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - No information.

Communication - Collins, ART 13 radio, 150W.

Echosounders - EDO, range 100 to 3,600 ft.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has two electric winches: one 7 HP with 1,200 m. of cable and a BT winch with 460 m.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

None.

## **HABITABILITY**

Carries 250 gal. fresh water.

## **OTHER FEATURES**

None.

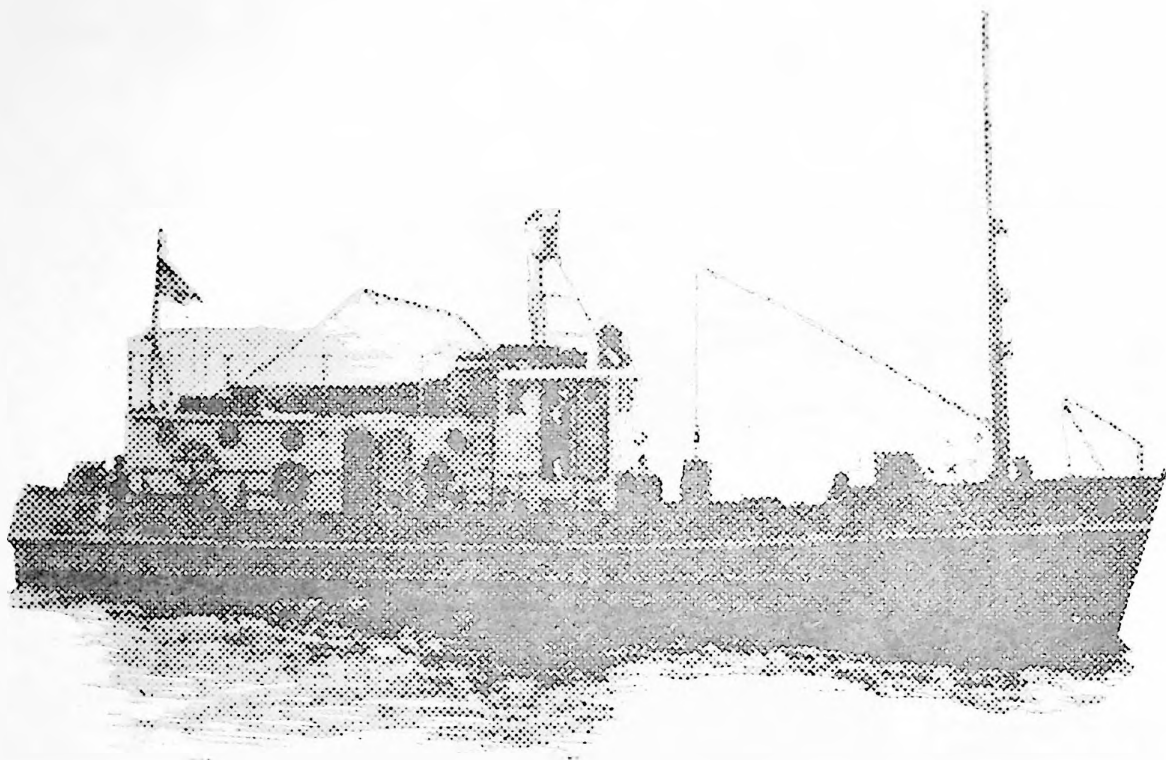
## **TYPE OF OBSERVATIONS**

BT, water sampling, currents, biological observations and fisheries protection.

## **REMARKS**

Generally works around the Hawaiian Islands.

# MANNING



TYPE: T-514.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1954	65'	18'	8'	95 tons (full)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
			800 miles	

## COMPLEMENT

CREW	SCIENTIFIC STAFF
4	(total)

**AFFILIATION**

Hudson Laboratories, Columbia University.

**PROPULSION**

Single screw, 6-cylinder Buda diesel engine, 270 HP.

**ELECTRICAL POWER**

No information.

**NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Gyrocompass, radio direction finder, loran, radar, and fathometer.

**HYDROGRAPHIC WINCHES AND EQUIPMENT**

Stern winch, capacity: 5,000 lbs. Boom, capacity: 1,000 lbs.

**ACOUSTICAL CHARACTERISTICS**

No information.

**LABORATORIES**

Forward hold is outfitted as laboratory space to house electronic instruments.

**HABITABILITY**

No information.

**OTHER FEATURES**

No information.

**TYPE OF OBSERVATIONS**

Near shore oceanographic observations.

**REMARKS**

Used in field operations in coastal waters.

# MARYSVILLE



**TYPE:** Commissioned as Patrol Craft, Escort, and Rescue (PCER 857), is now designated EPCE(R) 857.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1944	185'	34'	7'11" fore 9'9" aft	824 tons		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		

## COMPLEMENT

CREW	SCIENTIFIC STAFF
63	5

## **AFFILIATION**

U. S. Navy Electronics Laboratory, San Diego 52, California.

## **PROPULSION**

Two General Motors 12-278A diesel engines, each with 1,000 HP. Twin screws, non-controlled pitch. Uses diesel fuel, 24,815 gal. capacity.

## **ELECTRICAL POWER**

Ship generates 300 KW AC and 60 KW DC. Requires 120 KW AC for normal ship operations. For scientific use 180 KW AC and 60 KW DC is available. Characteristics of the electrical power: 440V 60-cycle, 3 HP 120V DC.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Loran, magnetic compass, gyrocompass, surface radar, pitometer, sonar.

Communication - Standard navy radio telephone and CW equipment.

Echosounders - EDO 600 ft., 600 fms., 6000 fms.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Has various types available

## **ACOUSTICAL CHARACTERISTICS**

No information

## **LABORATORIES**

One general purpose laboratory.

## **HABITABILITY**

Steam heat. Salt water showers.

## **OTHER FEATURES**

Equipped with 4 transducer chain columns. No antirolling devices.

## TYPE OF OBSERVATIONS

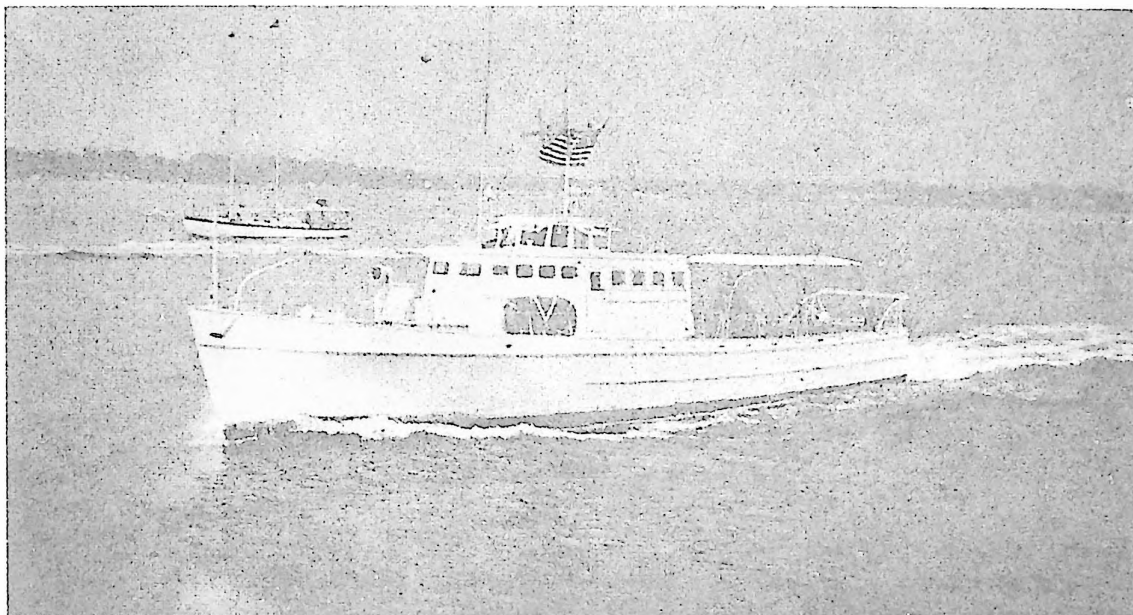
Winches interchangeable. Ship capable of making dredge hauls and serial bottle casts to 20,000 ft. Thermal structure of upper layers measured with 900 ft. thermistor chain. Unit automatically plots isotherms on 19" wide paper. Temperature sensing elements hang nearly vertical as ship proceeds. With sensing elements operating from surface to 800 ft. "two-dimensional oceanography" is achieved in depth and distance.

## REMARKS

Ship named for city in California. Converted for research in 1947 to the EPCER 857 (first E stands for Experimental). Other vessels in regular use at N. E. L. are the TRIESTE, the REXBURG (EPCER 855) and the BAYA, a former fleet submarine. Sister ships engaged in oceanographic survey and research for the U.S. Navy Underwater Sound Laboratory are the USS SOMMERSWORTH (EPCER-849), FAIRVIEW (EPCER-850) and BRATTLEBORO (EPCER-852).



# MAURICE F. FITZGERALD



**TYPE:** Coast Patrol Boat

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
	83'	16'	5'			

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
12			1,500 miles	21 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
4	6

## **AFFILIATION**

The Geraldines Lts. 90 Compromise Street, Annapolis, Maryland.

## **PROPULSION**

Has two 550 HP diesel engines (currently undergoing conversion).

## **ELECTRICAL POWER**

Two 10 KVA 120/240 AC generators, 200 amp.-hrs. 110V DC battery bank, converter, rectifier.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Magnesyn compass, magnetic compass, direction finder, consolan, loran, radar, pelorus, stadimeter, celestial navigation equipment.

Communication - Single side band transceiver, radio marine telephone, citizens band transceiver, communication receiver.

Echosounding - Deep sea and shallow fathometer.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One deep sea instrument winch, 15,000 ft. multiconductor cable; one double gypsy winch; stern davits, 5,000 lb. for streaming and cargo handling; amidship davits and cargo boom.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

No information.

## **HABITABILITY**

Air-conditioning, electric range, laundry facilities.

## **OTHER FEATURES**

Has deep freeze.

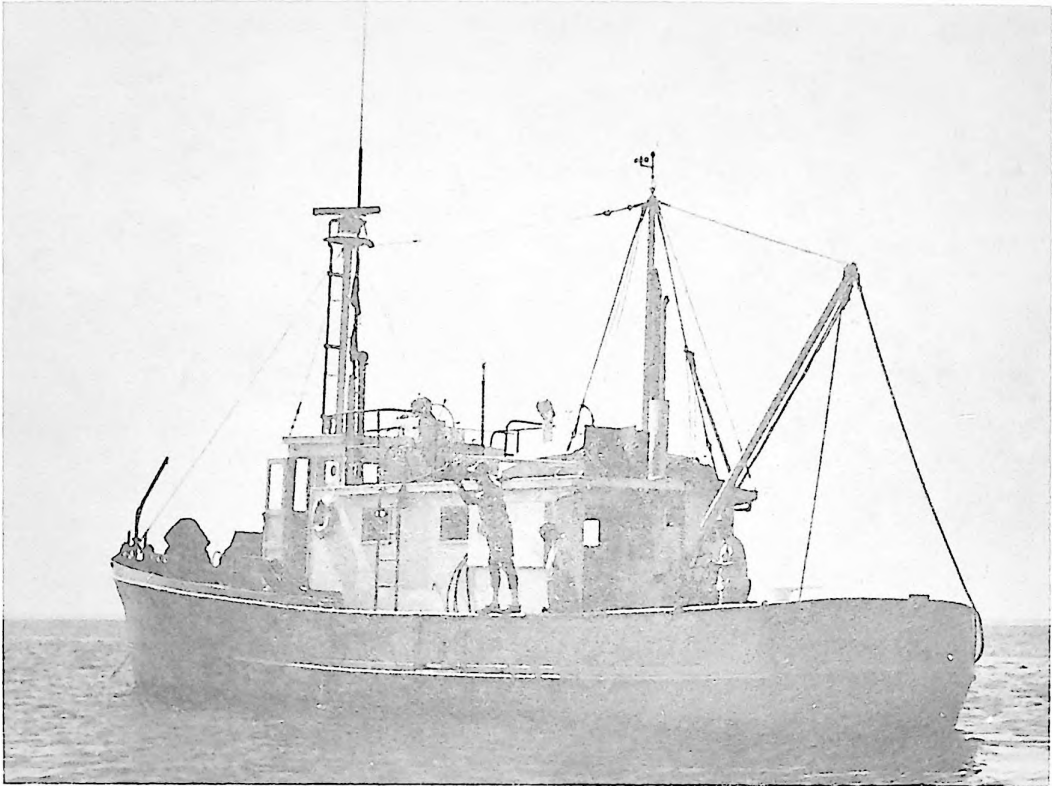
## **TYPE OF OBSERVATIONS**

Electro-acoustics, underwater sound, oceanography and instrumentation.

## **REMARKS**

Ship carries 12 ft. inboard dory, 8 ft. dinghy with outboard motor.

## MAURY



**TYPE:** Designed for estuarine oceanography and survey. Hull is Byers Wrought Iron.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1950	65'	15'9"	3' fore 5 1/2' aft	40 tons (loaded)	33	23

### PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
10	12	3	325 mi. at 10 kts.	5 days

### COMPLEMENT

CREW	SCIENTIFIC STAFF
3	4

## **AFFILIATION**

The Chesapeake Bay Institute of the Johns Hopkins University,  
Baltimore, Maryland.

## **PROPULSION**

Diesel power, 165 HP, with single standard propeller, no sails.  
Generally uses dieselect fuel but can use #2 furnace oil if high  
grade diesel is not available.

## **ELECTRICAL POWER**

Ship generates 6 KW, 110V AC and 1.6 KW, 32V DC. Normal ship operation requires 3 KW, 110V AC and 0.5 KW, 32V DC. For scientific work 6 KW, and 500W highly regulated current available. Power characteristics are 110V AC, 60-cycle, single-phase; 32V DC and 6, 8, 12, and 24V DC.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Two magnetic compasses, sextants, Sperry radar #10 with 18 mile range.

Communication - Apelco 75W transmitter, 6 channel. Receiver, 6 channel, crystal control.

Echosounders - Navy portable fathometer to 450 fms.; NH-7, flash and recording; Bendix fathometer to 60 ft. or fms.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Hand winches used for hydrographic lowerings; coring winch consists of electric 2 HP 22:1 geared winch with 175 ft. of 3/8" wire, friction brake and mechanical clutch.

## **ACOUSTICAL CHARACTERISTICS**

No evaluation of acoustical characteristics has been made.

## **LABORATORIES**

One laboratory (15' x 6') used for all types of work. Has meteorological equipment for wind speed and direction.

### **HABITABILITY**

Used in mid-latitudes only. Fresh water capacity 450 gal. (5 days supply), no distillation apparatus.

### **OTHER FEATURES**

No antiroll devices but has four hydraulic anchor winches to provide for maximum stability on anchor stations.

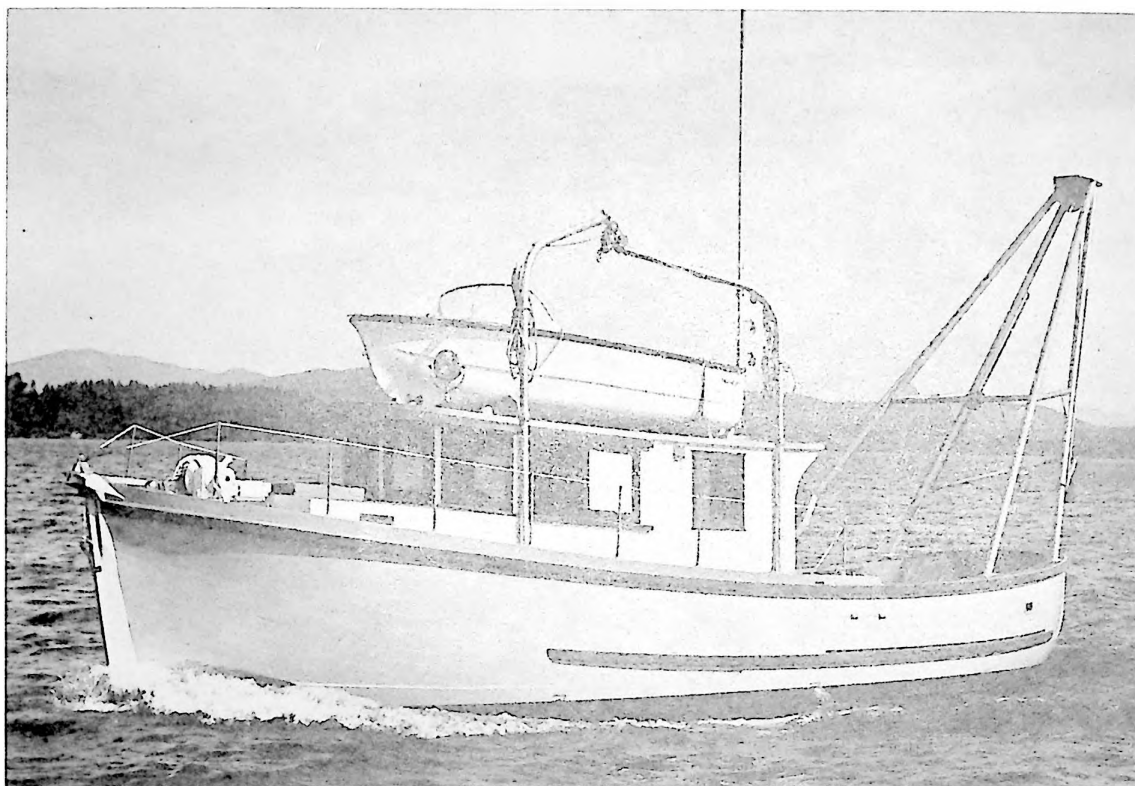
### **TYPE OF OBSERVATIONS**

Shallow water hydrographic stations, biological collections, current observations, coring, dye study stations, and anchor stations.

### **REMARKS**

Named after Matthew Fontaine Maury, first U. S. Oceanographer.

# NATCHIK



**TYPE:** Greenland Cruiser, built and equipped for oceanographic research, biological observations and hydrographic survey.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1959	38'3"	11'10"	3 1/2' (mean)	16 tons		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
7 at 3/4 engine load	9 at 4/4 engine load		1,200 miles	7 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
1	3

## **AFFILIATION**

Arctic Research Laboratory, Point Barrow, Alaska. Operated by University of Alaska under contract with Office of Naval Research.

## **PROPULSION**

One 85 HP, single purpose gasoline Chrysler engine, Marine type. Single fixed blade propeller. Gasoline capacity 524 gal.

## **ELECTRICAL POWER**

One 10 KW gasoline generator, 110V AC, Kohler 4-cycle for general purposes.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Magnetic compass, radio, directional finder and automatic pilot.

Communication - Apelco radio 100W, and loran ADF.

Echosounder - One EDO, 100 fms.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One hydraulic winch, mechanical level wind with 12,000 ft. cable.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Has 60 sq. ft. of laboratory space. Deck space 225 sq. ft.

## **HABITABILITY**

Dual purpose area 26 sq. ft., carries 50 gal. fresh water.

## **OTHER FEATURES**

Fore plates of steel are built to withstand ice pressure and rough wear.

### TYPE OF OBSERVATIONS

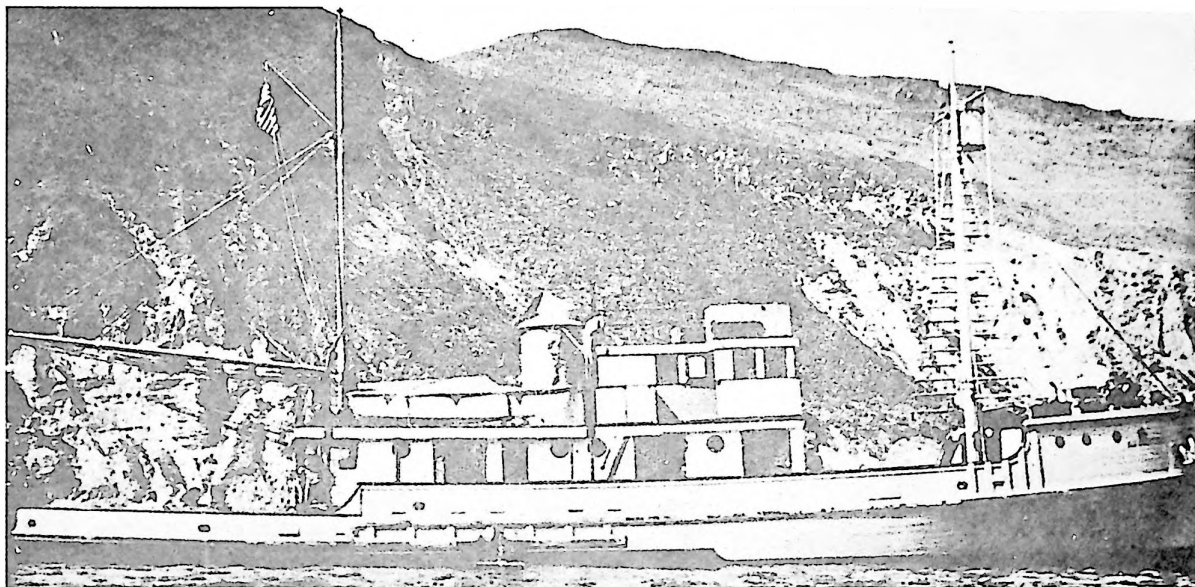
Oceanographic, biological, and hydrographic work. Has barometer, barograph, anemometer and psychrometer for meteorological observations.

### REMARKS

Vessel well suited for required purposes. Vessel name is an Eskimo word meaning, "ringed seal."



# N. B. SCOFIELD



**TYPE:** Wood hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1938	100.6'	23.5'	10.8'		168	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
9	11		6,000 miles	30 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
9	3

## **AFFILIATION**

State of California, Department of Fish and Game, 511 Tuna Street, Terminal Island, California.

## **PROPULSION**

Heavy duty diesel engine (Union Diesel Co.) 350 HP at 280 r.p.m. Carries 37.3 tons fuel oil.

## **ELECTRICAL POWER**

Has two GM Sr. 71 generators, 40 KW and one GM 20 KW generator. Has 115V DC.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Raytheon "1,500" radar, 32 mi. range; R.C.A. LR-8803 loran 1,450 mi. range; Bendix ADF-100, 900 mi. range.

Communication - Apelco H-160 radio, 150 mi. range.

Echosounders - EDO-185, 12 KC, 36,000 ft. range and Simrad 510-6, 3,480 mi. range.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Electric hydrographic winch with 3,300 ft. of 3/16" cable, 30 KW. Electric trawl winch with 8,000 ft. cable, 30 KW. Electric line hauler 3 KW. Electric net hauler, gurdy, 2 KW.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Has 113 sq. ft. space available on deck.

## **HABITABILITY**

Carries 11 tons of fresh water.

### OTHER FEATURES

Vessel equipped with 36 ft. long bilge keels. Has Worthington York freezing equipment.

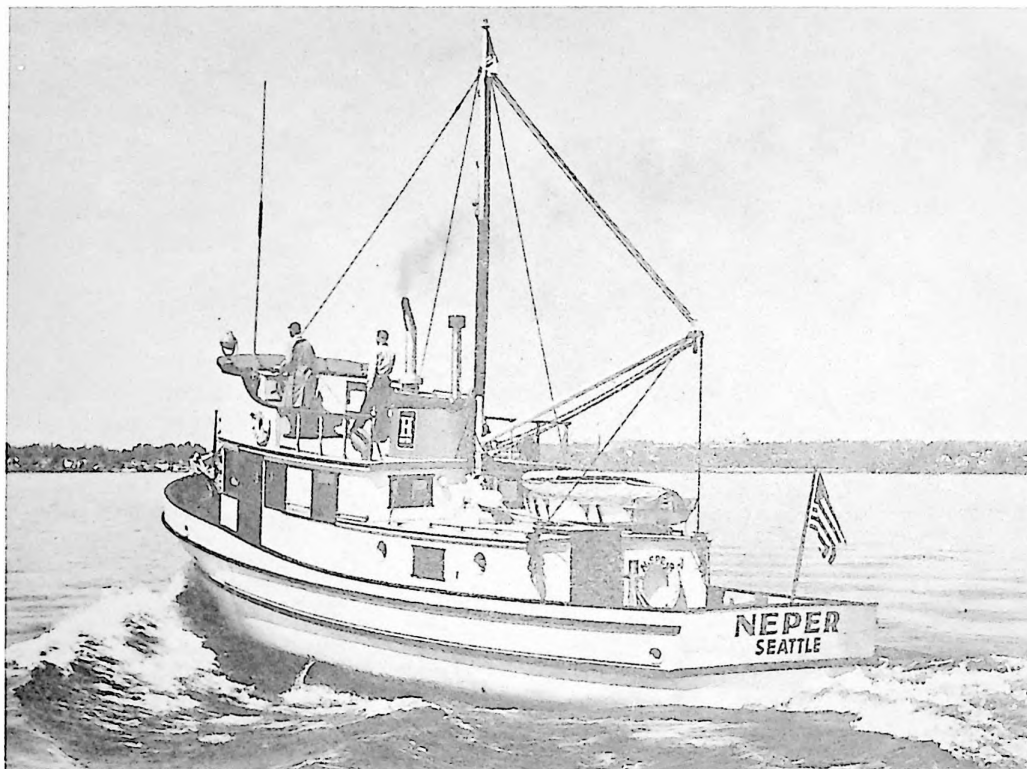
### TYPE OF OBSERVATIONS

BT, hydrographic casts, plankton tows, currents and fisheries research, mainly flat fish, tuna, sardines and mackerel.

### REMARKS

Vessel was expressly designed and built to carry on research work for the California Department of Fish & Game. Fantail is nearly awash when engaged in live bait tuna fishing. Vessel easily adaptable to various types of fishing and research gear. Generally works off southern California and Baja California.

## NEPER



**TYPE:** Designed for Sonar development operations, wood hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1955	48'	13.5'	5.6'	15 tons	23	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
8 1/2	10	3 1/2	1,000 miles	8 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
6 (total)	

## **AFFILIATION**

Minneapolis-Honeywell Regulator Company, Ordnance Division, Seattle  
Development Laboratory, 5303 Shilshole Avenue N. W., Seattle 7, Washington.

## **PROPULSION**

Diesel, clutched to shaft, single 38" fixed pitch propellor, 225 SHP.  
Carries 700 gal. diesel oil, Type #2. Main mast equipped with a stay  
sail.

## **ELECTRICAL POWER**

Ship generates 10 KW 220V 60-cycle, 3 KW 32V DC, and 1.5 KW 110V 60-cycle.  
For normal operation ship requires 1.5 KW 32V DC, leaving 1.5 KW 220V  
60-cycle, 4.5 KW 32V DC and 1.5 KW 110V 60-cycle for scientific gear.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Honeywell Sea Scanar, graphic recorder and two magnetic  
compasses.

Communication - One 8 channel 2-6 MC Apelco and two 31 MC portable sets.

Echosounders - Honeywell Sea Scanar, range 1,600 ft., time base RC, 5%  
accuracy, pulse width may be changed.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One 500 lb. winch, with 200 ft. of 1/8" wire, 15 ft./min., 32V DC,  
20 amp. Mast for winch is mounted midships and has 16 ft. beam. One  
500 lb. winch, with 1,800 ft. of 1/8" wire, 150 ft./min. 32V DC, 100  
amp. Mast for winch is at the stern and covers the fantail and 3 ft.  
overboard. One 1,500 lb. winch with 250 ft. of 5/16" wire, hand  
operated. Mast is at the stern and covers the fantail and 3 ft. over-  
board.

## **ACOUSTICAL CHARACTERISTICS**

Noiseless operation with all machinery stopped is possible, but not very  
suitable for most situations since the ships batteries are not adequate  
for supplying instrumentation power for long periods of time. The  
endurance of quiet operation is dependent upon prevailing conditions,  
weather, crew stamina, etc.

## LABORATORIES

Two laboratories: Main lab. and mechanical lab. (25 sq. ft.) with direct access to center wells. Both laboratories have all forms of energy, and heating and cooling.

## HABITABILITY

Vessel has no power cooling, but all compartments have good ventilation. Carries 360 gal. water, uses about 45 gal./day, no distillation apparatus, no salt water showers. Women have been housed.

## OTHER FEATURES

Has 4 tubes, 2 1/2" in dia. connecting to 11" dia. wells which are protected by a fairwater. No antirolling devices, can operate up to Sea State 3.

## TYPE OF OBSERVATIONS

Equipped to plant oceanographic data gathering buoys weighing 1,000 lbs. in water 2,000 ft. deep. BT acoustic observations.

## REMARKS

Comfortable and convenient for work in the semi-protected waters off Washington, British Columbia and Alaska.

## OCEANOGRAPHER

## DISCOVERER



**TYPE:** OSS-01 and OSS-02, Class I Oceanographic Survey Ships, welded steel construction. Specifically designed and equipped for comprehensive deep sea oceanographic surveys.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
Delivery 1964	Overall 303' Waterline 280'	52'	18'	3,805 L.T. (full load)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
16		as desired	16,000 N.M.	150 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
95	19 plus 1 VIP

## **AFFILIATION**

U.S. Coast and Geodetic Survey.

## **PROPULSION**

Twin screw propulsion from four Fairbanks Morse/Westinghouse main propulsion diesel generator sets supplying DC power to two 2,500 SHP Westinghouse propulsion motors, the bow thruster and the deep sea winch; with propulsion control from engine room, bridge, and aloft conning station. Navy standard diesel oil conforming to MIL-F-16884 with H.H.V. of 19,350 BTU/lb. is used for all services.

## **ELECTRICAL POWER**

Three 400 KW ship service generators supply 450V, 60-cycle, 3 phase power for ship service: Auxiliaries, ship systems, shops, oceanographic lab. and constant voltage; 120V, 60-cycle power for lighting, appliances, electronic equipment and special purposes; 120V, 3 phase, 60-cycle power for navigation, I.C. and fire alarm systems; 24V DC rectified power for general alarm and I.C. battery charging. Normal ship service power demand is about 400 KW. Shore connection is 450V, 3 phase, 400 amp.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass, Sperry Mk 14, Model 3, modified for 80 degree latitude, with course recorders located in plotting room and gravity room, and synchro information to 8 stations; gyro pilot; underwater log; dummy log; navigation radar, Decca 969 with ARP-50 plotter, in pilot house; buoy tracking radar, Decca 838 in oceanographic lab., with slave display in pilot house; deep water sonar, AN/UQN 1-B, EDO Model 185, with transducers at the bow and 1/3-length, and two recorders located in plotting room; shoal water sonar, DE-723, with a pair of transducers P/S forward and a pair amidships, and recorders located one each in plotting room, pilot house and oceanographic lab.; PDR's, one each in plotting room and oceanographic lab.; loran "A", AN/SPN-25, RCA LR-8803, with receiver located between plotting room and pilot house; loran "C", AN/SPN-30, with 2 receivers in plotting room; radio direction finder, RCA 8714, with receiver in plotting room; portable radio direction finder, RCA CRM-D1A.

Communication - Main radio receiver, RCA CRM-R2A, HF and IF SSB, 18 bands covering 80 KC to 30 MC; emergency transmitter, RCA ET-8043, MF, 350 to 515 KC; emergency receiver, RCA AR-8510, LF and IF, 4 bands covering 15 to 650 KC; automatic alarm signal unit, RCA AR-8603; two receivers, Collins 51J-4, 30 bands covering 0.54 to 30.5 MC, for AM, CW, MCW, SSB and FSK reception; transceiver, Collins 32 RS-1, HF SSB 1.6 to 15 MC; two mobile transceivers, Collins 32MS-1A HF SSB, 1.6 to 15 MC, one in each of the 33 ft. launches; transceiver, Collins KWT-6/8, MF and HF 2 to 30 MC, with Collins 40N-1 frequency standard; radiotelephone, RCA CRM-P7A-150, 2 to 9 MC, with emergency transmission on 2182 KC;



auxiliary radiotelephone, RCA ET-8058, VHF, 6 frequencies between 148 and 174 MC, arranged for duplex operation with an RCA AR-8519 receiver; four portable radiotelephones, Motorola P-33, VHF 170.2 and 171.8 MC, one for each boat; base station, Motorola "Compa-Station", VHF, for reception and transmission on 170.2 and 171.8 MC; facsimile equipment, Times Facsimile Corp. Model RRJ, arranged for operation with an RCA CRM-RIA radio receiver on 20 frequencies; standard frequency broadcast service (WWV) communication receiver, RCA AR-8516, AM and CW, in 18 bands covering 80 KC to 30 MC, with time signal circuit; main transmitter, RCA ET-8017, IF on 10 frequencies; transmitter, RCA ET-8063, HF SSB, 50 frequencies in five bands covering 2 to 30 MC, with an RCA RM-334 remote HF receiver; portable lifeboat transmitter receiver, RCA ET-8053; radio teletype, operating with the Collins KWT 6/8 SSB transceiver and two Collins 51S-1 HF communication receivers.

Echounders - Narrow beam stabilized transducer, GE 965-CGS, range to 6,000 F, 20 KC, with 2 Westrex Mk 15 recorders located one each in plotting room and oceanographic lab.; Lodar, Elac LSE-30, with LAZ 17 recorder located in pilot house.

#### **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Deep sea, 150 HP electro-hydraulic, with 45,000 ft. of 3/4" to 3/8" stepped wire, located on main deck aft; two double drum oceanographic, 30 HP electro-hydraulic, Northern Line, each with 30,000 ft. of 3/16" wire and 12,000 ft. of 6 conductor electrical logging cable, located on superstructure deck aft; dredge and trawl, 40 HP electro-hydraulic, Northern Line, with 6,000 ft. of 3/8" wire, located on superstructure deck aft; three BT, Northern Line, located two on main deck aft and one on boat deck forward.

#### **ACOUSTICAL CHARACTERISTICS**

Not equipped for silent operation, one 33 ft. launch fitted for use as a silent platform.

#### **LABORATORIES**

All scientific working areas are air conditioned and are served by interconnecting wireway trunks and communication facilities. The oceanographic laboratory is rectangular, with sections for wet and dry work open to the central work and control centers, and a net total area of 3,400 sq. ft. including the office and a data center room. A monorail loop serves the laboratory and adjoining fantail working areas. Facilities provided include salt water and H/C fresh water, gas, compressed air, 120V at general service, 450V, 3 phase 60-cycle power, and a bank of wet cell batteries. It is equipped with GEK, magnetometer, salinity bridge, shoal water fathometer, PDR, sea

water temperature recorder, and remote indicators for course, speed, gravity and winch data. Modular laboratory furniture units enable flexible arrangement of the central work center to suit individual projects. The meteorological office has 160 sq. ft. of working area and has direct access to the balloon inflation room and the meteorologists' stateroom. It is equipped with radiosonde receiver, balloon tracking radar, and repeaters for sea water temperature, wind speed and direction, and ship's course and speed. Meteorological rocket equipment will be added when available. Gravity room, 80 sq. ft., net useful area. Plotting room, 530 sq. ft., net. Photographic laboratory, 165 sq. ft., net.

## **HABITABILITY**

Comfortable quarters with air conditioning. Individual stateroom for chief scientist, and double staterooms for 10 scientists and eight visiting scientists. Arrangements enable accommodation of women guest scientists. Normal fresh water consumption for all purposes is approximately 5,000 gal./day. Storage capacity of about 104 tons and distiller capacity of 8,000 gal./day are provided.

## **OTHER FEATURES**

Main propulsion and principal auxiliary machinery and associated systems are automated by a Westinghouse centralized engine room control (CERC) system. A 6 x 8 ft. center well extending to the main deck in the oceanographic laboratory, with a hatch and handling gear located on the superstructure deck, is available for operation in higher sea states and for use with experimental equipment. The bow thruster is a 400 HP, fixed pitch, thru-hull unit with 10,000 lb. thrust. Space and power for portable core freeze boxes are available in the oceanographic laboratory. A constant frequency system serves all applicable centers and stations. Cathodic hull protection and ice strengthening are provided. The forward crane has a capacity of 7,300 lbs. at 40 ft. radius; the aft crane has a capacity of 5 long tons at 35 ft. radius and is mounted off-center to handle long cores. Six ports in the bow observation chamber enable viewing forward and to the sides. A passive rolling tank will enable operations to continue up to Sea State 7.

## **TYPE OF OBSERVATIONS**

Underway operations include continuous hydrographic, magnetic, gravity and surface temperature measurement, plus BT, meteorological, and GEK observations. Uncontaminated surface sea water is brought direct to the oceanographic laboratory from the forward sampling chest, and biological tows and trawls can be made at reduced speeds. On station

operations can include water sampling by Nansen bottles and direct from sampling chest, light and heavy coring, rock dredging, bottom photography, bottom heat flow measurements, biological tow, trawls, and dredges, deep current measurement, and other measurements requiring electrical conducting cable.

#### REMARKS

The OCEANOGRAPHER will carry forward the name of an earlier C&GS vessel engaged in hydrographic survey operations in Atlantic off-shore and Gulf coastal waters. The officer and crew personnel of C&GS ships are fully experienced in scientific operations and participate with assigned scientists in the direction and conduct of the work.

# OCONOSTOTA



**TYPE:** Ex-U. S. Navy Harbor tug, YTM-375, converted for oceanographic research. Steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1944	102'		12'	322 tons		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
10 1/2	12	1	5,500 miles	22 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
10	4

## **AFFILIATION**

Scripps Institution of Oceanography, University of California.

## **PROPULSION**

Diesel-Electric, single fixed blade screw, 950 HP. Uses Type 2-D Mobil fuel diesel, or equivalent, tank capacity 24,500 gal.

## **ELECTRICAL POWER**

Ship generates 100 KW 230V DC and 60 KW 115V DC. The 230V DC is used for winch operation only. Fifteen KVA of 115V, 60-cycle, single phase AC is furnished by motor generators.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Sperry gyrocompass (MK 18) with 4 repeaters, master magnetic compass, Raytheon fathometer, AN/SPS 46 radar, Electro magnetic log, Anemometer, auto pilot.

Communication - Mackay 216B Radio telephone, Carib, and Lifeboat transmitter.

Echosounder - Towed EDO transducer used in conjunction with PDR.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Deep tow winch (converted well logging winch) handles 30,000 ft. of 350" double armor, two conductor logging cable. One BT winch with drum capacity for 2,000 ft. of 3/32" wire or 1,500 ft. of 1/8" wire.

## **ACOUSTICAL CHARACTERISTICS**

Not equipped for quiet ship operation.

## **LABORATORIES**

Has 160 sq. ft. of dry laboratory space which is used primarily for portable electronic instrument racks. Power outlets, 230V DC, 115V DC, and 115V AC are provided. The laboratory is equipped with gyro repeater, anemometer repeaters, intercom and electro magnetic log repeaters.

## **HABITABILITY**

Ship is ventilated mechanically for reasonable comfort in warm weather. An electrical heating system provides reasonable comfort in temperate zones in winter. No fresh water distillation apparatus is installed. Fresh water showers are provided.

## **OTHER FEATURES**

The stern area is served by an articulated crane which facilitates material and instrument handling.

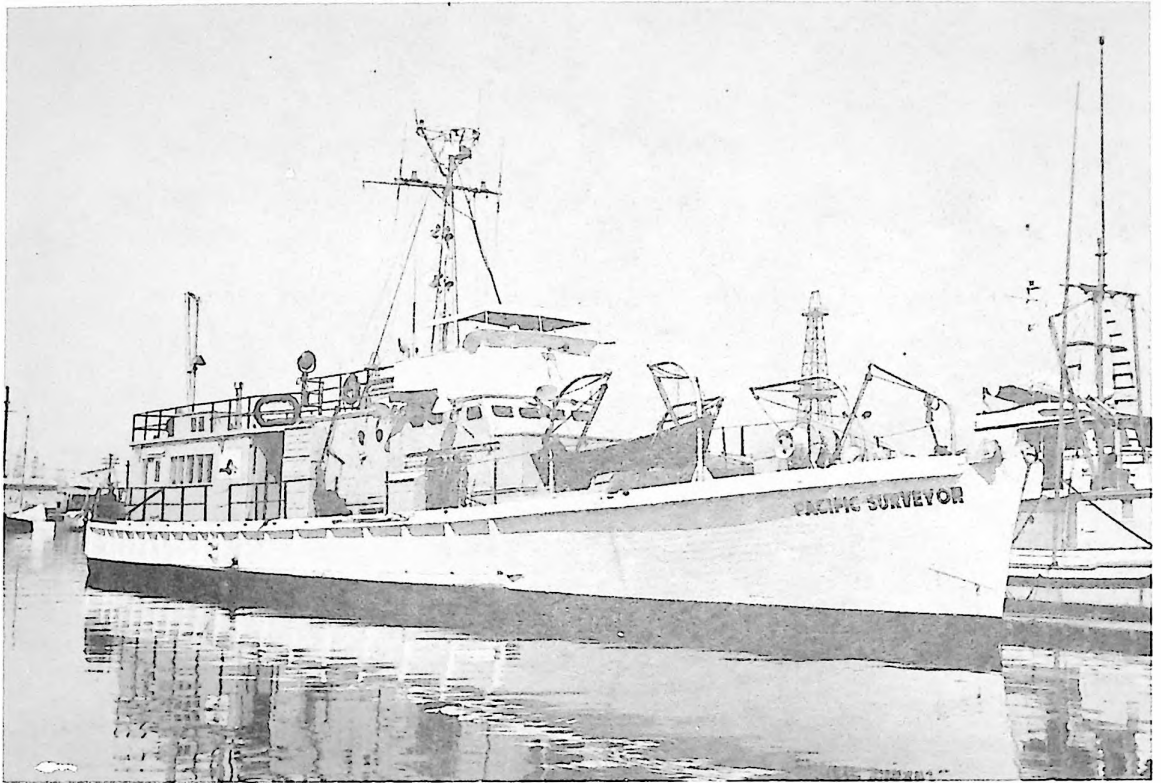
## **TYPE OF OBSERVATIONS**

The ship is utilized for specialized work involving towing of instruments and is not fitted for general oceanography. No hydrographic or dredge winches are carried on board and no wet laboratory facilities exist.

## **REMARKS**

None.

# PACIFIC SURVEYOR



**TYPE:** Modified Navy Subchaser, wood hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1943	110'	18.1'	9.3'		129.8	88

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
9 1/2	12	1 1/2	2,400 miles	15 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
6	17

## **AFFILIATION**

Douglas Aircraft Co., Inc. Corporate Offices, 3000 Ocean Park Boulevard, Santa Monica, California.

## **PROPULSION**

Two main engines, General Motors Model 671, 170 HP each twin screw. Auxiliary 20,000W, 110V DC generator, vibration isolated. One 35,000W, 110/220V, three-phase with 10,000W, 110V DC motor generator. Fuel capacity 3,100 gal., uses automotive diesel # 1 fuel.

## **ELECTRICAL POWER**

Ship generates 60 KW, from one 20 KW, 110V DC motor generator; one 30 KW, 110/220V AC, three-phase; and one 10 KW, 110V DC motor generator. Has additional battery power.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Magnetic compass; "Sperry" with 4 repeat stations (gyro).

Communications - One 150W, 5-frequencies radio telephone with ranges of 1800 KC to 4412 KC, 123.5 MC. Public address system on board ship with 4 speakers.

Echosounders - One RCA, NMC fathometer 4000 fms., 17-27 KC.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

BT and oceanographic winch.

## **ACOUSTICAL CHARACTERISTICS**

Noiseless condition can be sustained for 8 hrs.

## **LABORATORIES**

Oceanography and meteorology laboratory 13 1/2' wide forward, 8 ft. wide aft., 27 1/2 ft. long.

## **HABITABILITY**

Carries 2,300 gal. fresh water. Can operate in temperate as well as tropic climates. Distillation capacity 20 gal/hr.



## OTHER FEATURES

Vessel and its equipment can be quickly modified (or alternate equipment installed) to complete most sea research operations.

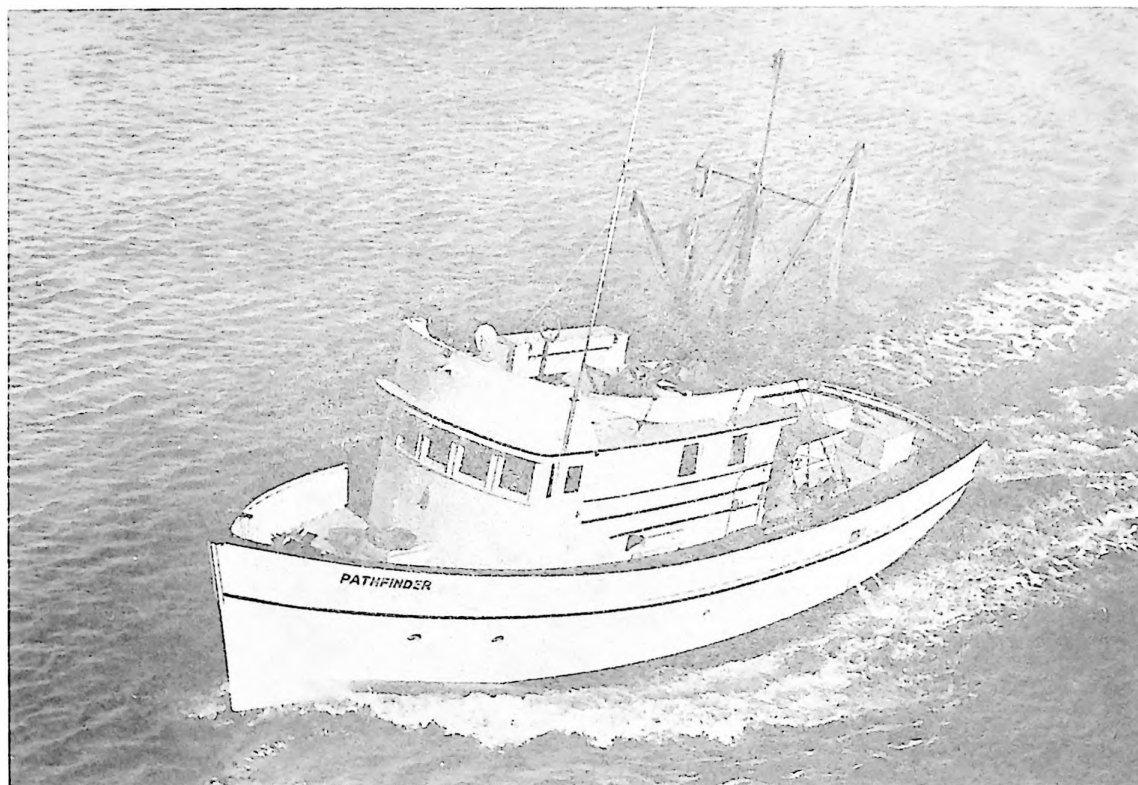
## TYPE OF OBSERVATIONS

Continuous magnetic recordings, gravity, soundings, seismic work. BT, hydrographic casts, soundings, coring, dredging, underway bottom sampling, current observations, biological sampling, bottom photography, transparency measurements; atmospheric radiation, temperature, humidity, pressure, wind velocity and precipitation measurements.

## REMARKS

Shipboard analytical laboratory capabilities, dissolved oxygen, chlorinity, PH, EH. Extensive open-deck areas, multiple storage spaces, handling equipment, and a depth-charge launcher further broaden the capabilities of the Pacific Surveyor.

## PATHFINDER



**TYPE:** Wood hull, trawl design; specifically constructed for shallow water oceanographic research.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1957	55' (overall)	17' (extreme)	5' (light) 6' (full)	51 tons (full load)	37	29

### PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
8	9	3	600 miles	5 days

### COMPLEMENT

CREW	SCIENTIFIC STAFF
2	5
(all male)	

## **AFFILIATION**

Virginia Institute of Marine Science; School of Marine Science, College of William and Mary. Located at Gloucester Point, Virginia.

## **PROPULSION**

Diesel engine, Caterpillar Model D-326, 160 HP. Single, fixed blade propeller. Uses diesel No. 2, 800 gal. capacity.

## **ELECTRICAL POWER**

Ship generates 9 KW and requires 2 KW for normal operation. Characteristics: 2.1 KW available at 32V DC; 0.9 KW available at 110V AC, 60-cycle; 6.0 KW available at 120V AC, 60-cycle. Shore power can be converted to 32V DC with a Constavolt Model 1532 marine converter.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Has loran, magnetic compass, ship log, radio direction finder, sextant, and depth finder.

Communication - Radiophone (100 mile range)

Echosounders - Bendix and EDO. Precision is plus or minus 0.5'. Ping length can be changed. Other variables are not recorded on the same graphs.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Two light winches and two heavy winches, electric powered, located midships aft.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Has 60 sq. ft. laboratory with fresh and salt water and compressed air, 32V DC and 120V AC 60-cycle.

## **HABITABILITY**

Shelf and open bay in mid-latitudes. No tropic or polar facilities. Stores 300 gals. fresh water; no distillation equipment.

### OTHER FEATURES

Susceptible to intense roll. Can perform oceanographic observations up to Beaufort 4 Sea State.

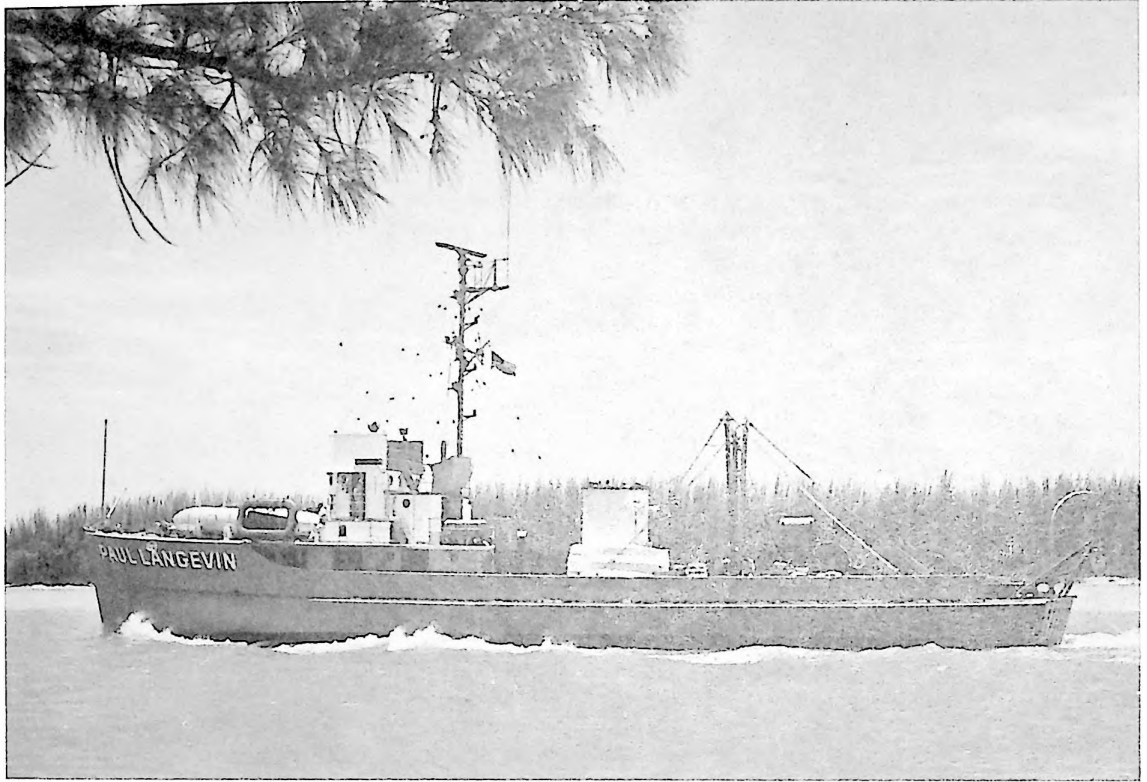
### TYPE OF OBSERVATIONS

Hydrographic cast, bottom sampling, coring, dredging, plankton and net tows.

### REMARKS

Named in honor of Matthew Fontaine Maury, "Pathfinder of the Seas."

# PAUL LANGEVIN



**TYPE:** Converted Navy Minesweeper, wooden hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1943	136'	25'	9'	350 tons (full) 270 tons (light)	233	159

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
10	11.5	3	1,500-3,300 miles	6 weeks

## COMPLEMENT

CREW	SCIENTIFIC STAFF
12	10

## **AFFILIATION**

Marine Acoustical Services, Inc., 1975 N.W. South River Drive, Miami 35, Florida.

## **PROPULSION**

Twin diesels, controlled from engine room or bridge. Two propellers, 500 HP each shaft. Uses #2 diesel oil or gasoil at 30 to 35 gal. per hour.

## **ELECTRICAL POWER**

Ship generates 60 KW DC, 30 KW DC and 115.5 KW AC. Required for ship use, 40 KW DC and 10 KW AC. Available for scientific equipment 50 DC, 105.5 AC. Characteristics of power are - 120V DC, 90 KW; 450V AC, 3-phase, 60-cycle (1% voltage regulation), 100 KW; 120V AC, 3-phase (closed delta), 80 KW; 120/208V AC, 3-phase (Wye), 80 KW; 120V AC, 3-phase, 60-cycle, 15 KW; and 120V AC, single-phase, 0.5 KW. Inasmuch as the lower AC voltages are derived from the 450V AC supply, the sum of demands at all AC voltages may not exceed 80 KW. Transformer banks may be reconnected to give any or all of the above listed voltages. DC battery supply can be provided.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Sperry Mark XIV gyrocompass with repeaters, magnetic compasses (2), Decca 838 radar, Sperry loran, Sperry automatic steering.

Communication - Pierce Simpson R/T, 2 MC, 72W, A3 emission; TCZ transmitter, 0.2-18.1 MC, A1 A2 A3 emission, 20-90W; TCS-12 receiver, 1.5-12 MC, A1 A2 A3 emission; TCS-12 transmitter, 1.5-12 MC, A1 A2 A3 emission, 15-25W; RBL-5 receiver, 15-600 KC, A1 A2 A3 emission; HQ-180 Hammarlund receiver, .54-30 MC, A1 A2 A3 SSB emission. Single-sideband transmitting equipment on hand which may be installed as necessary.

Echosounders - NMC fathometer with precision 60-cycle power supply (with 19-in. precision graphic recorder as needed). Fairway depth indicator (0-5 ft., 0-50 fms.)

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

BT winches, winches equipped with slip rings for use with sound velocity measuring apparatus, and winches suitable for coring and bottom sampling. A double drum, double gypsy head winch is being installed. Each drum will hold 4,000 ft. of 9/16" cable.

## **ACOUSTICAL CHARACTERISTICS**

Noiseless condition can be sustained for at least 24 hours.

## **LABORATORIES**

Two laboratories, main deck level 14' x 14', below main deck 12' x 21'. Compressed air available. Some space available for an additional laboratory. May be air-conditioned on short notice.

## **HABITABILITY**

Not heated, air-conditioning to be installed. Carries 1,400 gal. fresh water. Distiller with 1000 gal./day capacity.

## **OTHER FEATURES**

Equipped with portable engine-control device that permits vessel to be conned from any position topside. No antirolling devices, can operate to Sea State 4.

## **TYPE OF OBSERVATIONS**

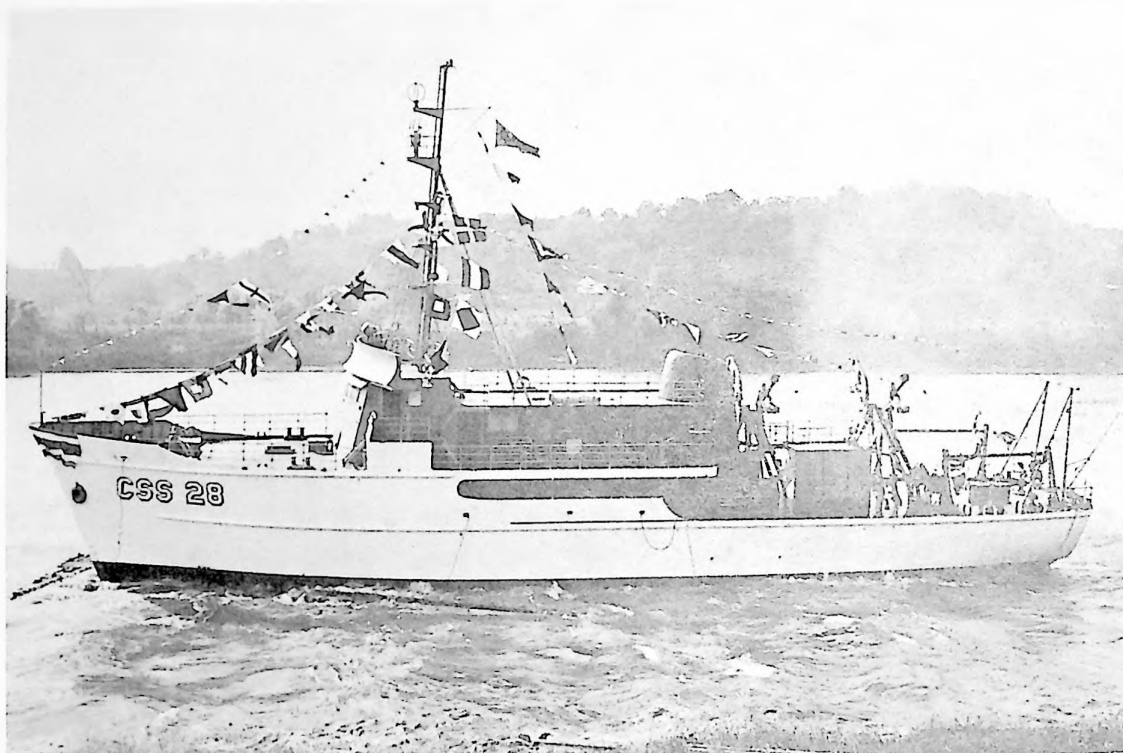
BT, continuous surface temperature, echo sounding to 4,000 fms., deep sea array planting to 3,800 fms., sound velocity, Nansen cast, precision bottom contour.

## **REMARKS**

Carrier 16' Boston Whaler with outboard motors. Named after scientist who pioneered in the use of the piezoelectric qualities of quartz for the generation of underwater sound. Galley capable of preparing meals for 60 people. Space could be provided for 2 women scientists.

PEIRCE

WHITING



**TYPE:** Class III Hydrographic Survey Ship. Specifically designed for combined hydrographic survey operations, but will have limited oceanographic capabilities. The ship has a steel hull and is ice strengthened.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1962	163' 7" (overall)	33'	9' 6" (full) 8' 1" (light)	760.1 L.T. (full)		

#### PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
12.5			4,500 miles	15 days

#### COMPLEMENT

CREW	SCIENTIFIC STAFF
36 (total)	



## **AFFILIATION**

U.S. Coast and Geodetic Survey.

## **PROPULSION**

Twin screw diesel, 800 SHP each with controllable pitch propellers controllable from both a pilot house and engine room control console.

## **ELECTRICAL POWER**

Ship service generators will be two 220 KW, 450V AC, 60-cycle, 3 phase units. The emergency diesel generator will be one 60 KW, 450V AC, 3 phase, 60-cycle unit. Ships service power will be 115V AC, 60-cycle single phase; 115V AC, 60-cycle; single phase regulated power and 115V AC, 60-cycle single phase controlled frequency power will be also available for certain electronics and scientific equipment.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation and echosounding equipment - One deep water depth recorder, Model UQN-1F; one PDR; two shoal water (Raytheon DE-723) depth recorders with associated equipment; one Loran "A" receiver - indicator system; one surface search radar system; one radio direction finder; one HI-FIX positioning system; one shoran positioning system; one underwater log, electro-magnetic type; one gyrocompass system and one gyro pilot system. In addition standard navigation equipment such as, magnetic compass, whistle, rudder angle indicator etc., will be installed.

Communications - Two HF SSB transceivers; two radio telephone T/R (intermediate powered); radio telephone T/R (narrow band VHF); portable radio telephone T/R (narrow band VHF); direction finder signal inter-lock and two communication receivers.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One BT winch, electro-hydraulic. The drum capacity is 4,000 ft. of 3/32" diameter 7 x 7 aircraft cord stainless steel wire rope. One double drum oceanographic winch, electro-hydraulic. The upper drum capacity 6,000 ft. of .298" electrical double armored cable, 6 conductors. The lower drum capacity is 15,000 ft. of 3/16" dia. 3 x 19 wire rope. One dredge and trawl winch, electro-hydraulic. The drum capacity is 6,000 ft. of 3/8" dia. 3 x 19 wire rope.

## **ACOUSTICAL CHARACTERISTICS**

Ship cannot be used for silent operations.

## LABORATORIES

Chart and plotting room 256 sq. ft.; radio room and workshop 112 sq. ft. and oceanographic laboratory 80 sq. ft. These spaces are all air-conditioned and the navigation instruments and communications equipment will be in compartments as applicable. A magnetometer system will be installed in the oceanographic laboratory.

## HABITABILITY

Ship will be able to operate in both tropical and arctic areas. Officer and crew messing and berthing areas completely air-conditioned. There are no provisions for either women scientists or scientists other than ships normal complement. Fresh water capacity 5,768 gals., distillation 2,000 gals./day.

## OTHER FEATURES

Ship will be fitted with an antiroll tank located under the pilot house using potable water for the stabilizing liquid.

## TYPE OF OBSERVATIONS

Continuous bottom profile, BT (0-900 ft.) bottom samples (snapper, coring, dredging), current observations, Nansen casts, plankton casts, magnetic observations (with towed proton precision magnetometer).

## REMARKS

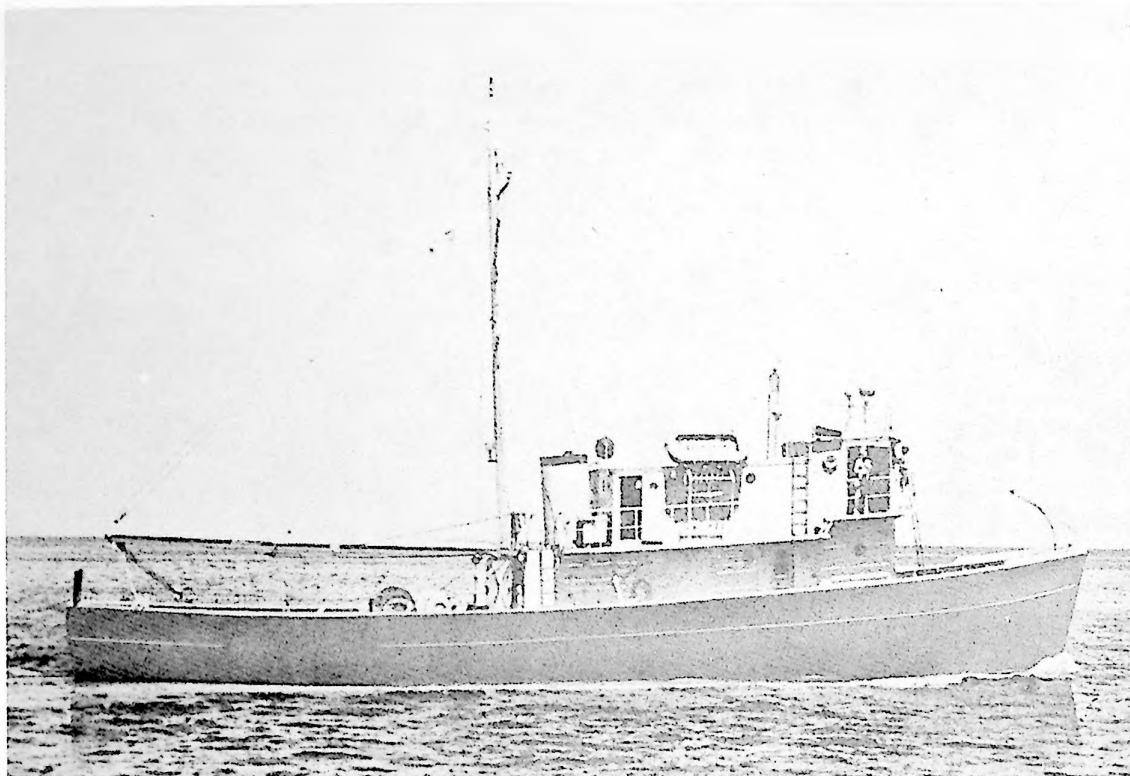
PEIRCE (CSS-28) Named in commemoration of Charles Sanders Peirce, who contributed a wide variety of technical and scientific accomplishments to the Coast Survey during his 30 years service in the Bureau, extending from 1860 to 1890. He was the son of Benjamin Peirce, who was Superintendent of the U.S. Coast Survey from 1867 to 1874. His research and development in pendulums, map projections and gravity made lasting contributions to the Bureau's scientific standing. Charles Sanders Peirce was the outstanding American logician of his day and is known especially as the founder of "Pragmatism." Important segments of the scientific community now hold that Charles Sanders Peirce was one of the greatest minds produced in America during the 19th century.

WHITING (CSS-29) Named in commemoration of Henry Laurens Whiting one of the most illustrious men employed in the long history of the Coast Survey. Born in Albany, New York in 1821, he came to work for the Survey in 1838

at age 17. For nearly 60 years, until his death in 1897, he remained in the Federal service where he became one of the leading scientists of the Nation, and an expert in his profession of topographic surveying. His professional excellence in topography was internationally respected during his lifetime. His fellow surveyors in the Coast Survey were quoted as saying that Whiting could make a more accurate map of the other side of the hill without seeing it than they could on the ground on which they were standing. By special assignment, Mr. Whiting served as Professor of Topographical Engineering at the Massachusetts Institute of Technology for two years and was detailed to the U.S. Naval Academy for one year, where he inaugurated a course of instruction in land and harbor surveying.



# PRIVATEER



**TYPE:** Fishing Vessel.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
	97'	22'	8'			

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
			2,000 miles.	

## COMPLEMENT

CREW	SCIENTIFIC STAFF
	15 (other than crew)

## **AFFILIATION**

Marine Exploration Company Incorporated, 561 W. 35th Place,  
Hialeah, Florida.

## **PROPULSION**

Superior, 400 HP engine.

## **ELECTRICAL POWER**

Two 60 KW 120V DC generators; AC available.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

No information.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Electric 4-drum multi-speed type winch. Has one 12 tons boom and  
two 2 ton booms. Ships lifting capacity is 12 tons.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Open deck space 22' x 40' unobstructed.

## **HABITABILITY**

No information.

## **OTHER FEATURES**

Has complete diving gear for 5 men. Pumping capacity of 2,000 gal./  
min., 300 lbs./sq.in. jet.

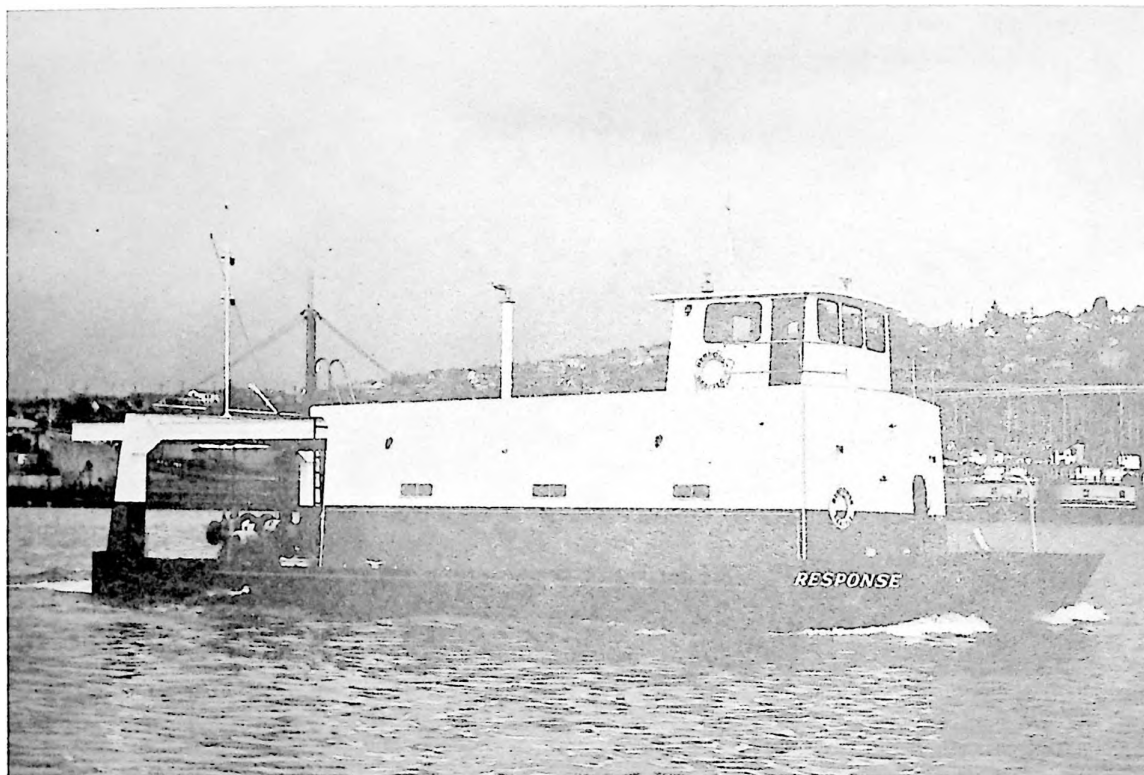
## **TYPE OF OBSERVATIONS**

Will perform observations according to requestors requirements.

## **REMARKS**

With heavy lifting capacity, sea keeping qualities, and working  
space she can handle heavy objects overside; skill in diving  
operations, underwater photography, sonar operations, and data  
acquisition. Company qualified to set up and assist in the  
operation of electronic equipments, and can design special equipment  
should this be required.

## RESPONSE



**TYPE:** Specially designed steel research ship with catamaran hull. Built to A. B. S. requirements.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1962	65'	25'	4.5' (full) 4.0' (light)	75 long tons (full) 68 long tons (light)	95	80

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
7.5	8.4	2.5	limited by endurance	12 hours

## COMPLEMENT

CREW	SCIENTIFIC STAFF
2	8

## **AFFILIATION**

Minneapolis-Honeywell Regulator Company, Ordnance Division, Seattle  
Development Laboratory, 5303 Shilshole Avenue N.W., Seattle 7, Washington.

## **PROPULSION**

Two diesel engines (Harnischfeger Model V463M, 135 HP each), clutched and geared to twin screws (fixed 16" pitch, 27" dia.). May be propelled by one engine at reduced speed with steering unaffected. Uses diesel oil Type 2.

## **ELECTRICAL POWER**

Ship generates: 75 KVA 440V 60-cycle, 1 KW 32V DC, 20 KW 120V DC, 350W 32V DC, 5 KW 120V 60-cycle. Power required for ships operation: 300W 32V DC and 5 KW 110V 60-cycle. Power available for scientific apparatus and instruments: 70 KVA 440V 60-cycle 3 phase Delta which is transformed to 45 KVA 208/120V 60-cycle 3 phase Wye and 25 KVA 440V 3 phase Delta. Also 20 KW 80 to 150V DC, 5 KW 120V 60-cycle single phase, 100W 32V DC, 1000W 32V DC, 32V 120 battery; 2 KW single phase 400-cycle from amplifier.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Honeywell "searchlight" sonar, magnetic compass, and sextant.

Communication - Radio telephone 65W, 2-3 MC and 5W, 35 MC.

Echosounder - Minneapolis Honeywell Sea Scanar. Trainable in Azimuth and elevation; ranges, 40, 400, 800, 1600 ft.; time base - repetition rate oscillator; accuracy - 5%; recorder resolution - 5%; pulse width may be changed.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Electric bow winch with 600 ft. of 3/8" wire, 30 ft./min. average, maximum pull 400 lbs. Stern winch with 2,000 ft. of 9/16" wire, average speed 75 ft./min., maximum line pull 3,800 lbs., 440V, 3 phase motor, 2 speed reversible, two 24" gypsies. Electric traveling crane with 40 ft. of 3/8" chain, 10 ft./min., 2 ton capacity.

## **ACOUSTICAL CHARACTERISTICS**

Radiated noise has not been measured. Internal noise with main generator running: main laboratory 50-60 DB, after deck 70-80 DB. Noiseless condition with auxiliary generator isolated - acoustically, mechanically, 12 hr. max. - limited by crew endurance.

## LABORATORIES

Four main laboratories: 1,200 sq. ft.; two acoustic areas, one mechanical area, one uncommitted. Access to water: five 3 x 4 ft. hatches, one 7 x 10 ft. hatch. Energy available: all electrical power, 125 PSI air, 2,000 PSI CO<sub>2</sub>, N<sub>2</sub>, 25 PSI fresh water, three 17,000 BTU/hr. air heaters. Laboratories are equipped with a considerable amount of acoustic test equipment. Auxiliary laboratory: 100 sq. ft., accessible to boat deck, ladder direct to main laboratory. Energy available - 100V AC, 32V DC, 125 PSI air, Instrumentation-anemometer, sonar display, radiotelephone.

## HABITABILITY

Vessel works in temperate climates. No sleeping facilities, good natural ventilation, electric heating, head and washbasin. Carries two 400 gal. tanks of fresh water.

## OTHER FEATURES

Catamaran hull: permits access to water - continuous opening from stern, one opening 7 x 30 ft., seven openings 3 x 4 ft., exceptional beam for given displacement - large laboratories, excellent stability, minimum rolling. Maneuverability - distance between screws aids turning; satisfactory on one screw. Vessel tows well.

## TYPE OF OBSERVATIONS

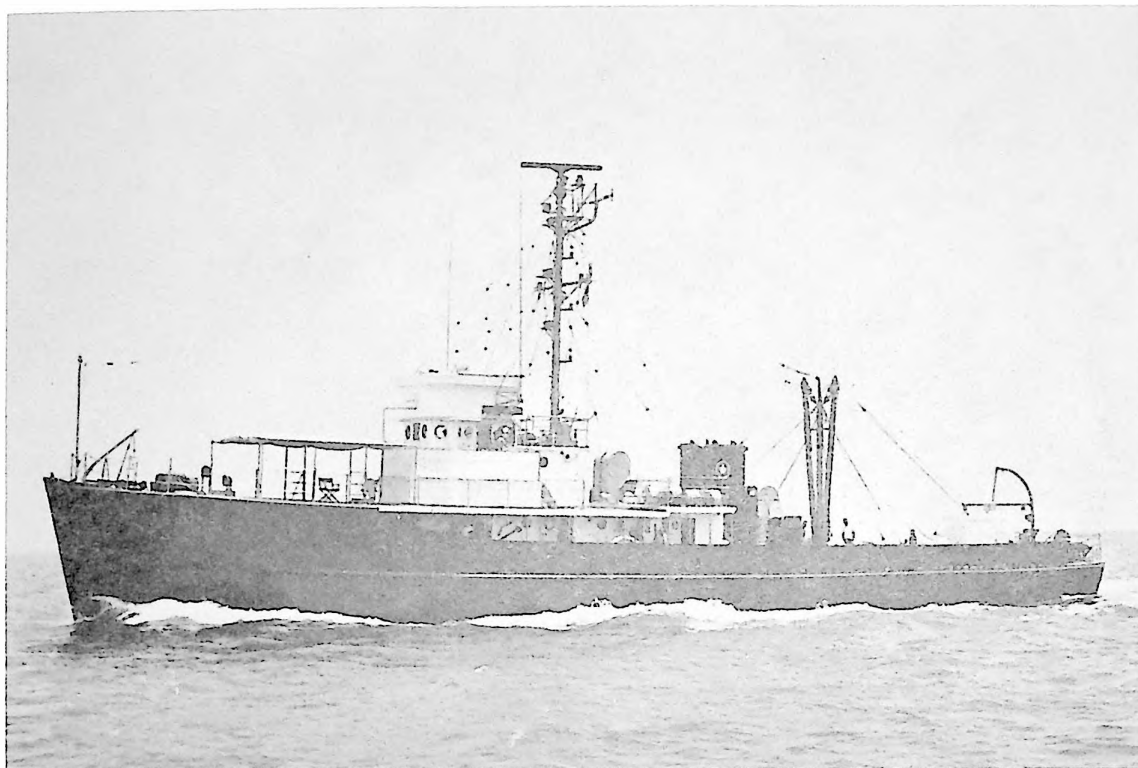
Hydrographic casts, continuous magnetic recording, all types acoustic, and buoy operations (tautwire submerged, stable spar, telemetry).

## REMARKS

Vessel generally operates off Washington, Alaska and British Columbia. Range and endurance can be increased with modifications.



## SIR HORACE LAMB



**TYPE:** Wood hull, Ex-U.S.S. Redpoll (YMS-57).

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1942	136'	25'	9'	320 tons		

### PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
10	12	4	3,100 miles	14 days

### COMPLEMENT

CREW	SCIENTIFIC STAFF
15	8

## **AFFILIATION**

Owned by U.S. Navy. Operated by Columbia University Geophysical Field Station, Bermuda.

## **PROPULSION**

Two 500 HP GM-8-268-A diesel engines through reduction gears to two propellers. Uses #2 diesel fuel. Usable tank capacity 7,640 gals. Uses 40 gal./hr. at 12 knots, 30 gal./hr. at economical speed.

## **ELECTRICAL POWER**

Has 30 KW DC and 60 KW DC diesel generators and a 15 KVA AC motor generator.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation: Gyrocompass, magnetic compasses, radar, loran, celestial, raydist if provided.

Communication: Transmitters: two TCS, 1.5 to 12 MC; TCZ, 200 to 18,100 KC; TCP, 2-3 MC; TED transmitter 225-400 MC, 220-400 MC; KWM-2 SSB transceiver. Receivers: NC-100; SRR-13A; RBO; two RED and two TCS12.

Echosounders: EDO, 6,000 fms. coupled into PDR. EDO transducer mounted on horizontal training gear. UQC-1 underwater receiver and transmitter.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One hydraulic caterpuller winch with 4,000 lb. line pull at 100 ft./min.; one hydraulic hydro winch; one BT winch; one double gypsy winch; one cargo winch; one storage reel, electric or hydraulic operation (2 ft. diam. reel with 5 ft. diam. drum).  
Port and starboard booms.

## **ACOUSTICAL CHARACTERISTICS**

One 15 KW DC diesel generator, shock mounted on deck and two 1 KVA motor generators shock mounted below deck.

## LABORATORIES

Permanent laboratory space (200 sq. ft.) primarily for electronics. Wet laboratory setup available. Many electric outlets and compressed air. PDR mounted in laboratory. Radio communication from laboratory. Sound powered phone system connecting to deck, radio room, flying bridge, and pilot house. Inter-communication between laboratory, radio room, and pilot house. Through bulkhead fittings for running electric cable. Radar in laboratory.

## HABITABILITY

Hot water boiler, 1,440 gals. of water. An 800 gal./day "Maxim" distiller. Wardroom area in laboratory with table and day-bed. Fresh and salt water showers. Ample storage space.

## OTHER FEATURES

One 14 cu. ft. and one 10 cu. ft. freezer, one normally available for scientific use. No anti-rolling devices but ship can conduct operations to sea state 3. Carries inflatable landing barge. Dark room facilities available.

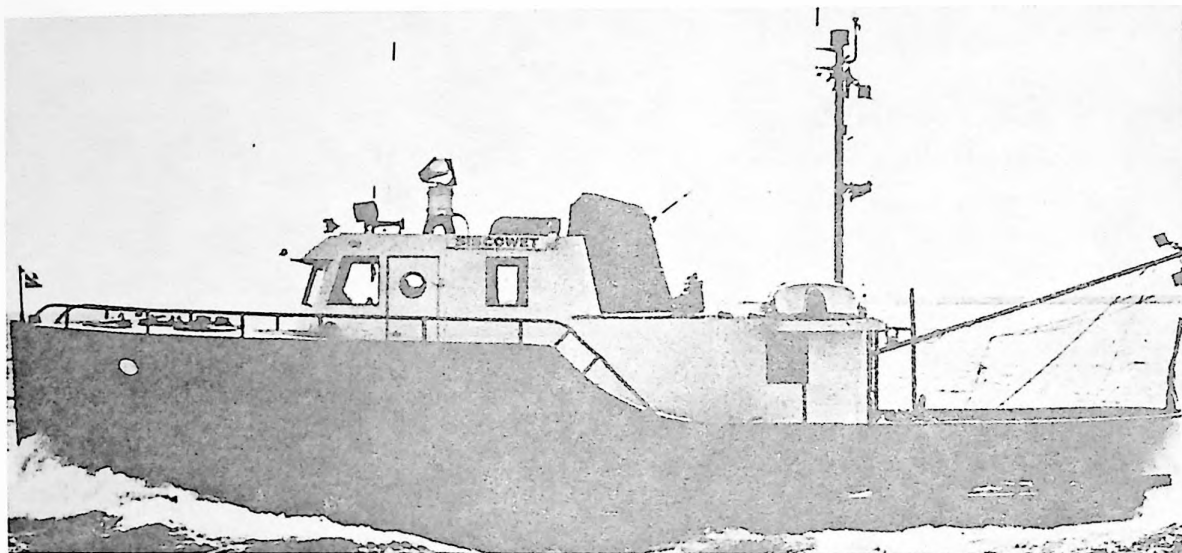
## TYPE OF OBSERVATIONS

Hydrographic casts, net tows, phytoplankton tows, bottom sampling, light coring and dredging. Seismic operations, deep moorings, and meteorological bottom soundings.

## REMARKS

Ship can carry large amount of explosives for seismic work. Ship available on charter to U.S. Government laboratories and contractors. On shore at the field station and available to visiting scientists are a large and fully-equipped electronics laboratory, machine shop and carpenter shop, as well as qualified technicians.

# SISCOWET



**TYPE:** Steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1957 (refitted)	52'9"	14'6"	7'		40.8	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
7.5	9		1,000 miles	one day

## COMPLEMENT

CREW	SCIENTIFIC STAFF
2	3

### **AFFILIATION**

U. S. Bureau of Commercial Fisheries, Field Station, Ashland, Wisconsin.

### **PROPULSION**

GM diesel, 147 HP at 1,650 r.p.m., with single fixed-blade propeller. Carries 3 1/2 tons of fuel oil.

### **ELECTRICAL POWER**

Has 220V and 110V AC from one GM diesel generator, 12.5 KW and one Allis-Chalmers diesel generator, 7.5 KW.

### **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Radar, RCA, CR-105-A, 30 mile range.

Communication - Pierce-Simpson medium frequency, Marine, Carib-130, 130W.

Echosounders - Bendix DR-12, 50 KC, range 300-1,200 ft.

### **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Hydrographic winches: one U. S. Navy, E 15/S hoist (3 HP electric) with 2,000 ft. of wire; one trawl winch, (Hathaway No. 8234, double drum, hydraulic drive) with 1,200 ft. of cable on each drum; and one gill-net puller, hydraulic drive.

### **ACOUSTICAL CHARACTERISTICS**

No information.

### **LABORATORIES**

Laboratory space, 105 sq. ft.

### **HABITABILITY**

Holds 1 ton of fresh water.

### **OTHER FEATURES**

None.

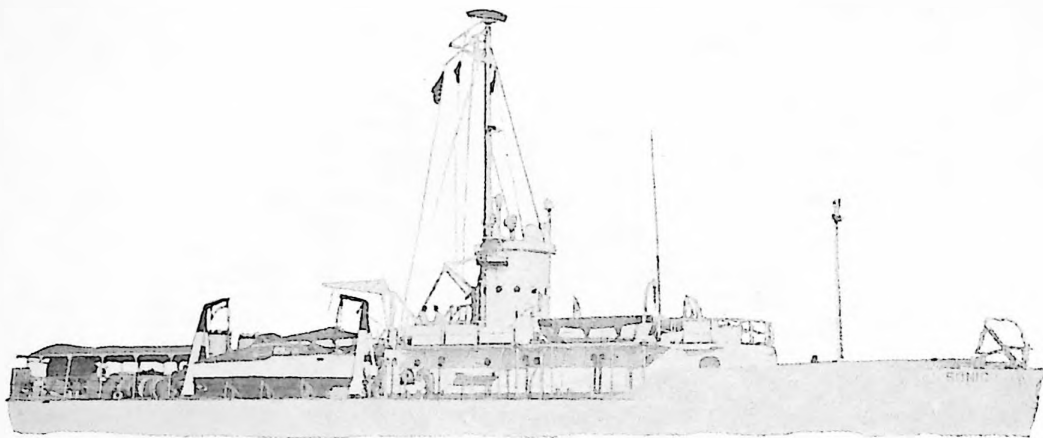
## **TYPE OF OBSERVATIONS**

BT, sea water samples, bottom grabs, plankton hauls, meteorological and biological observations and hydrographic survey.

## **REMARKS**

Works mainly in Lake Superior. Ship considered sea kindly.

# SONIC



**TYPE:** Equipped primarily for seismic work.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
	158'	24'	6' (loaded)	405 tons		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
	14			3-4 weeks

## COMPLEMENT

CREW	SCIENTIFIC STAFF
11	10

## **AFFILIATION**

Science Services Division of Texas Instruments Incorporated,  
Exchange Bank Building, Dallas 35, Texas.

## **PROPULSION**

Twin-screw GM diesel, 900 HP each shaft. Carries 35,000 gal. fuel.

## **ELECTRICAL POWER**

Two 60 KW AC generators.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Radar, Marine Autotraverse Positioner, (MAP system) and other electronic positioning systems, automatic pilot.

Communication - Ship-to-shore radio.

Echosounders - Recording fathometer.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Can be placed on board as required.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Laboratory facilities are available.

## **HABITABILITY**

Completely air-conditioned quarters. Carries six months food supply, and 15,000 gal. fresh water with facilities for converting 1,000 gal. of sea water daily to assure that prolonged operations can be carried out.



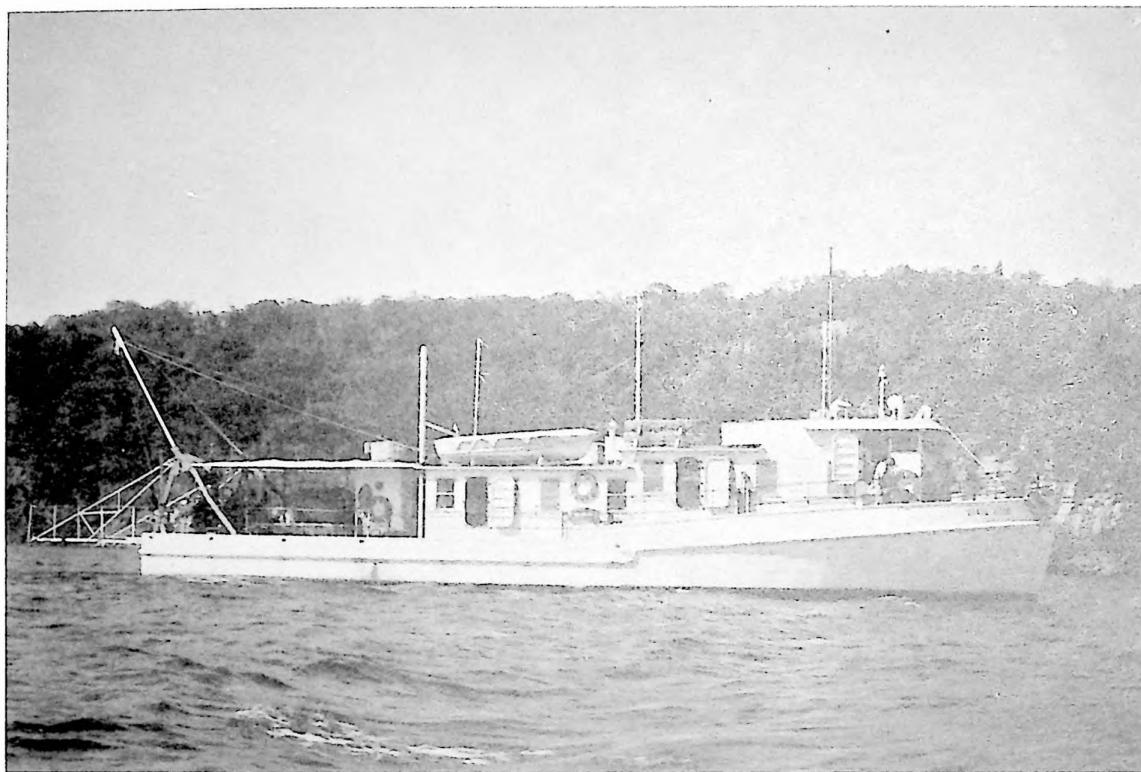
## OTHER FEATURES

Carries 100,000 lbs. of powder for seismic work. All types of special electronic, recording and processing gear, including 24 channels of full range Series 7000 amplifiers and magneDISC, oscillographs and Seismic Underwater Explorer (SUE).

## REMARKS

Specifically outfitted for geophysical exploration (gravity, magnetic, seismic) but can perform all oceanographic disciplines (physical, biological and geological). Has a 26-foot launch equipped with seismic amplifiers and magnetic recorders for work close inshore. Two other ocean-going scientific vessels, SEA SEARCH and TEXIN are owned and operated by Texas Instruments and a fleet of smaller vessels are under lease.

# STATE STAR



**TYPE:** Steel hull, formerly used for seismic oil explorations, converted by Daystrom Electric for underwater acoustic research.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1956	86'	22'	7'		134	91

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
9	10	2	4,000 miles	15 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
5	13

## **AFFILIATION**

Operated by Daystrom Electric, Poughkeepsie, New York. Owned by State Boat Corp., Houston, Texas.

## **PROPULSION**

Twin GM Mod. 6-110 diesels, generating 420 HP. Two propellers, fixed pitch, 210 HP each shaft. Uses fuel oil #2, capacity 9,000 gal.

## **ELECTRICAL POWER**

Has two 30 KW diesel generators, and one 10 KW gasoline generator. Ten KW required for normal ship operation. Fifty KW available for scientific apparatus and instruments. Power includes the following: 120V AC, 60-cycle; 208V AC, 60-cycle 3-phase, 115V AC, 400-cycle, 1 KW and 28V DC, 100 amp.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Magnetic compass, Raytheon Model 1700 radar, APN-70 loran receiver, ship's log.

Communication - ART-13 LF transmitter, ARC-27 UHF transceiver, BC-348 radio receiver, RCA 30W radio transceiver (crystal controlled for Marine frequencies), Hallicrafter S-38c 4-band receiver.

Echosounding - Raytheon Model D. E. Fathometer.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One BT winch, with 15,000 ft. of .093" wire. One combined single drum and gypsy winch, with 1,000 ft. of 5/16" cable, capable of developing a pull of 2,000 lbs. at 30 ft. per min.; one twin-drum deep sea winch and cable stowage reel powered by 17 HP diesel, capacity using .346" diameter cable is 42,000 ft. Cables of different diameter may be used with this winch by changing drums and pulleys and the level wind pitch on the storage reel.

## **ACOUSTICAL CHARACTERISTICS**

Ship equipped with 10 KW gasoline operated, vibration-isolated generator for minimum ship's noise.

## **LABORATORIES**

One electronics laboratory (340 sq. ft.).

## **HABITABILITY**

Not suitable for year-round work in tropical or polar regions. No distillation equipment. Fresh water storage 4,300 gal. No anti-rolling devices.

## **OTHER FEATURES**

Stern platform and "A" frame for handling equipment off fantail. Capable of lowering equipment to all depths down to ocean bottom.

## **TYPE OF OBSERVATIONS**

Primarily suitable for underwater listening by suspended hydrophones or tethered sonobuoys. Used extensively for explosive echo ranging experiments as well as acoustical measurements.

## **REMARKS**

Under special arrangement, Daystrom Electric scientific personnel can be made available. They can either work with other organizations or undertake a program in its entirety.

## SWAN



**TYPE:** Vessel was originally launched as YMS 470 converted to AMS 37 and then MSC(O) 37. Wood hull, compartmented by seven water tight bulkheads.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1944	137'6"	25'	8'9" (max.)	365 tons (full) 233 tons (light)	258.5	138

### PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
10.5	13.5	3.0	1,500-2,000 miles	30 days

### COMPLEMENT

CREW	SCIENTIFIC STAFF
8	16

## AFFILIATION

General Motors Corporation. Defense Research Laboratories. PO Box T, Santa Barbara, California.

## PROPULSION

Two high-speed two-cycle, 500 HP each diesel engine, 8-268A manufactured by Cleveland Diesel Division of General Motors Corporation. Two 4 bladed fixed-pitch solid hub propellers. Fuel consumption is approximately 32 gal./hr. at 10 1/2 knots. Uses clean diesel of modern type.

## ELECTRICAL POWER

The electrical power is developed by: 3-17 Detroit diesel driving a Delco 115V 30 KW DC generator; a 6-71 Detroit diesel driving a 115V 60 KW DC generator; a 115V DC motor driving a 115V 15 KW single-phase 60-cycles alternator. Special purpose motor alternators for gyro, radar, ships electronics. Nominal amount of 8, 16, 24 and 32V DC power is available. Normal ship load is 20-30 KW 115 DC. Has 60-70 KW 115V DC available for scientific work.

## NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT

Navigation - Radar, Sperry MK 3 with 7 ft. antenna, 40 mi. range; Sperry MK 14 gyro, two magnetic compasses, loran, hydrodist (Telnrometer), two sextants, chrometer, plotting arm and standard navigational plotting tools.

Communications - Raytheon transceiver 150W, 2-3 MC radio telephone, 4, 8, 12, 16 and 22 MC HF ship-to-shore bands; Hallicrafter 120 receiver 550 KC-30 MC; Motorola 30W, 153.44 MC; Motorola Conalrad; public address system of five stations; intercommunication system of eleven stations.

Echosounders - EDO Model 185 0-6,000 fms. with PDR Westrex Corporation. LGO MK V; Submarine Signal Company fathometer 0-400 fms.

## HYDROGRAPHIC WINCHES AND EQUIPMENT

One 30 HP electro-hydraulic drum on drum (Howard-Turner Mfg. Co.) winch. Level wind on each drum for 5/16", 3/8", 1/2", and 5/8" cable, capacity 8,000 ft. of 3/8" wire on each drum; located approximately amidship. One 22 HP diesel-hydraulic portable winch (Marco Engineering) single drum with level wind, 12,000 ft. of 3/16" cable, amidship. Navy standard sweep winch,

30 HP electro-hydraulic, with two drums side by side two 14" cat heads, drum holds 7,000 ft. of 3/8" wire, located on forecastle deck. One BT winch DC, with 5,000 ft. of 5/32" cable, amidships and rigged over retracting gallows frame.

### ACOUSTICAL CHARACTERISTICS

Not equipped for noiseless operation.

### LABORATORIES

Laboratory for electronics (16' x 22'), located amidship and below the weather deck and utility laboratory on forecastle deck (8' x 8') with 115V AC, single-phase, 60-cycle, and 115V DC.

### HABITABILITY

Inadequately heated to work at the Poles. Does not have ice skin protection. Could work in northern waters depending on the season. Electronics laboratory is air conditioned. Has satisfactorily worked the tropics. Potable water capacity is 2,600 gal. Maxim Scilencer (AMF) evaporator utilizing the salt water discharge from the 671 Detroit Diesel provides 250-350 gal./day of potable water.

### OTHER FEATURES

Equipped with rolling keels, observations may be taken to Sea State 4. Has 25 ft. monorail supported by two "A" frames and extending 10 ft. over the stern. A 5-ton air operated hoist travels on this rail. A 15 ft. boom, 1,000 lbs. capacity, is rigged to a forward "A" frame on each side of the ship. Scientific freezer in hold. A 15 HP, 3,000 lbs./sq. in. Scubba air compressor on board. Where sonar unit once was, two gate valve and water lock units have been installed allowing instruments to be lowered through the hull.

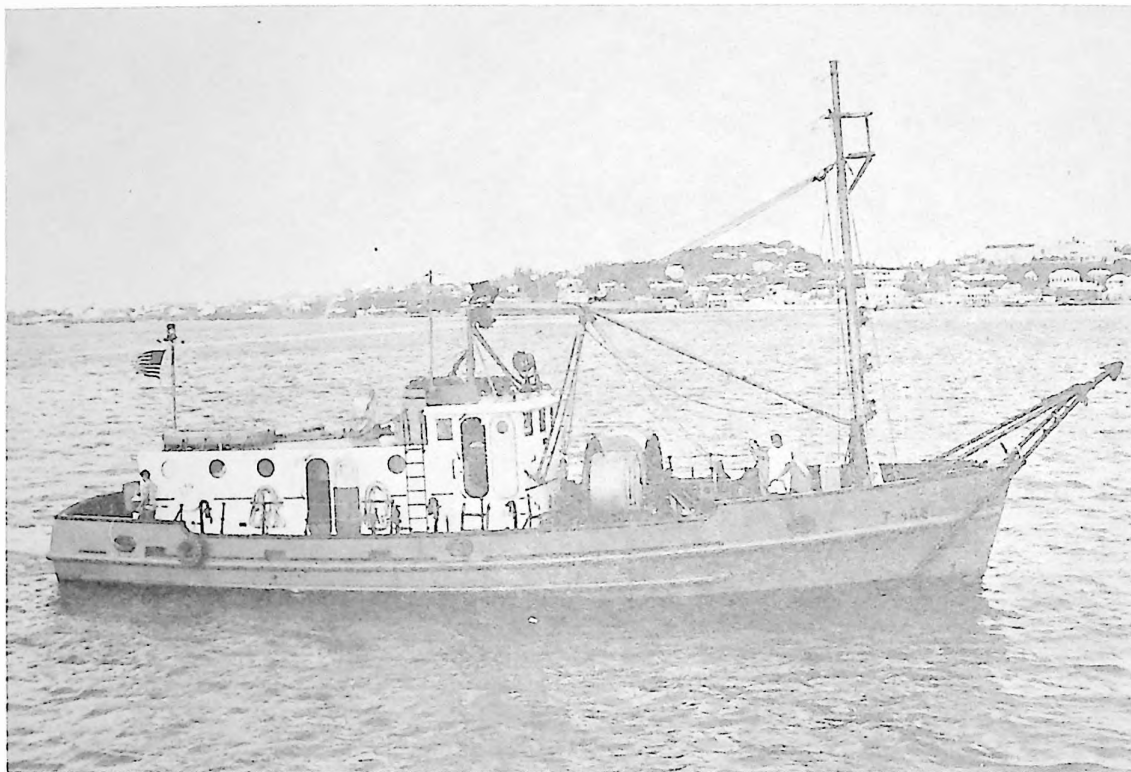
### TYPE OF OBSERVATIONS

Hydrographic casts, bottom sampling, coring, dredging, BT, trawling.

### REMARKS

Vessel is equipped with load cells, wire tension, indicators, meter reels and logistic support items. Carries 16 ft. powered launch. Can conduct limited salvage operations and lay cable (10,000 ft. of 1 1/8").

# T-426



**TYPE:** U.S. Army Steel-Hulled T - Boat.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1953	65'	17'9"	7'5"	95 tons		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
9.5	10.5	4.5	2,400 miles	8 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
5	4



## **AFFILIATION**

Owned by U.S. Army, on loan to the Office of Naval Research and operated as GFE by Columbia University Geophysical Field Station, Bermuda.

## **PROPULSION**

Has 275 HP diesel through reduction gear to single propeller.

## **ELECTRICAL POWER**

Two 20 KW 110V DC diesel generators; one 15 KVA 110V AC motor generator; and one 110V battery bank, 134 amp.-hrs. at 8 hr. rate.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation: Gyrocompass (Sperry Mk-22). Auto pilot AN/SPS-35 radar. D/F. AN/UQN-1B (0-6000 fms.) echosounder.

Communication: Transmitters: TCP 75W voice, TCS voice and CW 40W. Receivers: TCP-2 (2000-3000 KC) and TCS (1500-12000 KC).

Echosounders: AN/UQN-1B (0-6,000 fms.) precision depth recorder.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Two BT winches, one 900 ft.; one electric powered cable reel with capacity 6,000 ft. 1 1/2" OD or 30 mi. 1/5" OD; A-frame on bow for light submarine cable work with cable loads to one ton; one 1 ton freight boom.

## **ACOUSTICAL CHARACTERISTICS**

Has 110V battery bank (134 amp.-hrs. at 8 hr. rate) provides a silent ship capability.

## **LABORATORIES**

One permanent laboratory (90 sq. ft.) with many electrical outlets and compressed air.

### **HABITABILITY**

Carries 400 gals. fresh water. No distillation facilities. Refrigerator. No hot water.

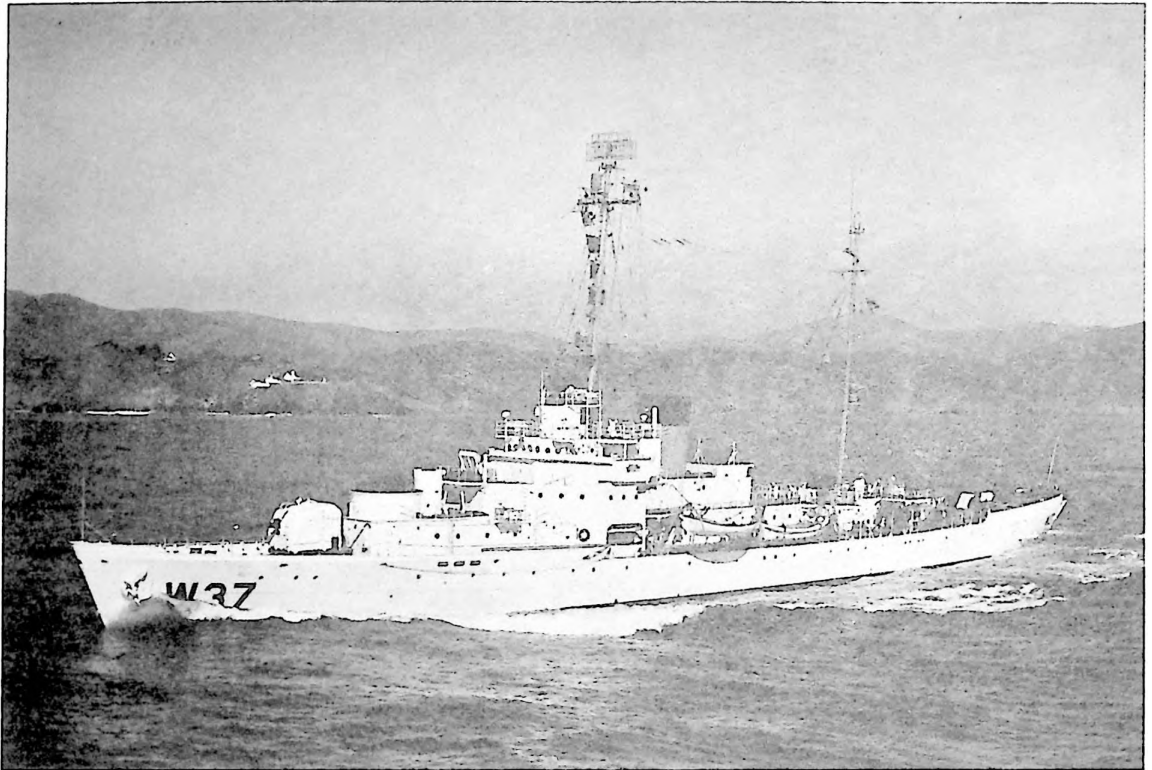
### **TYPE OF OBSERVATIONS**

This boat is primarily an inshore cable layer. Her captain is an experienced cable splicer and layer. BT observations. Seismic work.

### **REMARKS**

This boat is available on charter to U.S. Government laboratories and contractors. On shore at the field station and available to visiting scientists. Has a large and fully equipped electronics laboratory, machine shop and carpenter shop, as well as qualified technicians.

# TANEY



**TYPE:** Coast Guard Cutter, "Secretary" class (WPG-37), steel hull.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1936	327'	41'	14'3" (full)	2,585 tons (full)		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
	20.5		8,000 mi. at 12kts 12,300 mi. at 11kts	

## COMPLEMENT

CREW	SCIENTIFIC STAFF

## **AFFILIATION**

U. S. Coast Guard.

## **PROPULSION**

Oil burner propelled by twin screw geared turbine, 6,200 HP. Carries 572 tons of oil fuel.

## **ELECTRICAL POWER**

No information, but presumably has sufficient power to perform any oceanographic assignment.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - AN/SPS-29 radar.

Communication - Standard U. S. Coast Guard transmitters and receivers.

Echosounders - AN/UQN sonic depth finders, PDR.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

BT winch and oceanographic winches.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Meteorological laboratory equipped with radiosonde equipment and other meteorological instruments. Chemistry laboratory with salinometer. Balloon inflation shelter.

## **HABITABILITY**

Quarters comfortable for long patrols on ocean weather station.

## **OTHER FEATURES**

No information.

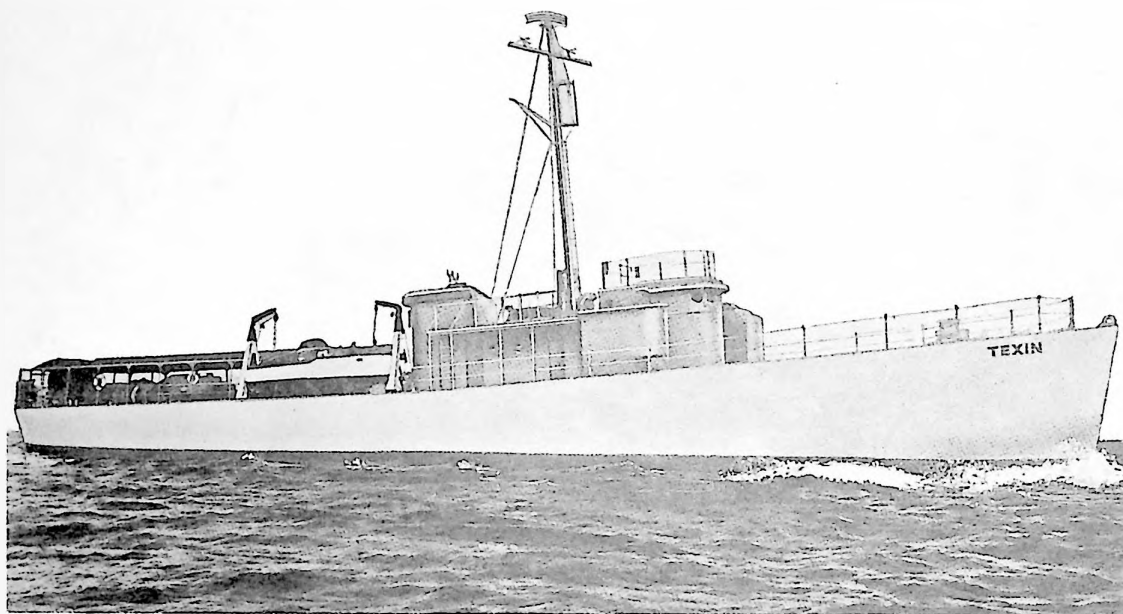
### TYPE OF OBSERVATIONS

Meteorological observations, soundings, sea and swell observations, fish, bird and other wildlife counts, subsurface temperatures, drift bottle releases, plankton samplings, and water and air samplings.

### REMARKS

Named after Secretary of the Treasury. Sister ship's are: BIBB, DUANE, CAMPBELL, SPENCER, INGHAM. These ships regularly serve as testing platforms for oceanographic and hydrographic research while manning ocean stations and performing other duties at sea.

# TEXIN



**TYPE:** Motor Vessel equipped primarily for seismic work.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
	174'	35	6 1/2' (loaded)	420 tons		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
	16 kts.		3,500 miles	3-4 weeks

## COMPLEMENT

CREW	SCIENTIFIC STAFF
30 (total)	

## **AFFILIATION**

Science Services Division of Texas Instruments Incorporated, Exchange Bank Building, Dallas 35, Texas.

## **PROPULSION**

Twin-screw GM diesel, 1,800 HP each shaft. Carries 35,000 gal. fuel.

## **ELECTRICAL POWER**

Two 60 KW DC generators, and auxiliary AC generators.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Radar, Marine Autotravers Positioner (Map system) and other electronic positioning systems, automatic pilot.

Communication - Ship-to-shore radio.

Echosounders - Recording fathometer.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Can be placed on board as required.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Laboratory facilities are available.

## **HABITABILITY**

Completely air conditioned quarters. Carries six months food supply, and 15,000 gal. fresh water with facilities for converting 1,000 gal. of sea water daily to assure that prolonged operations can be carried out.

## OTHER FEATURES

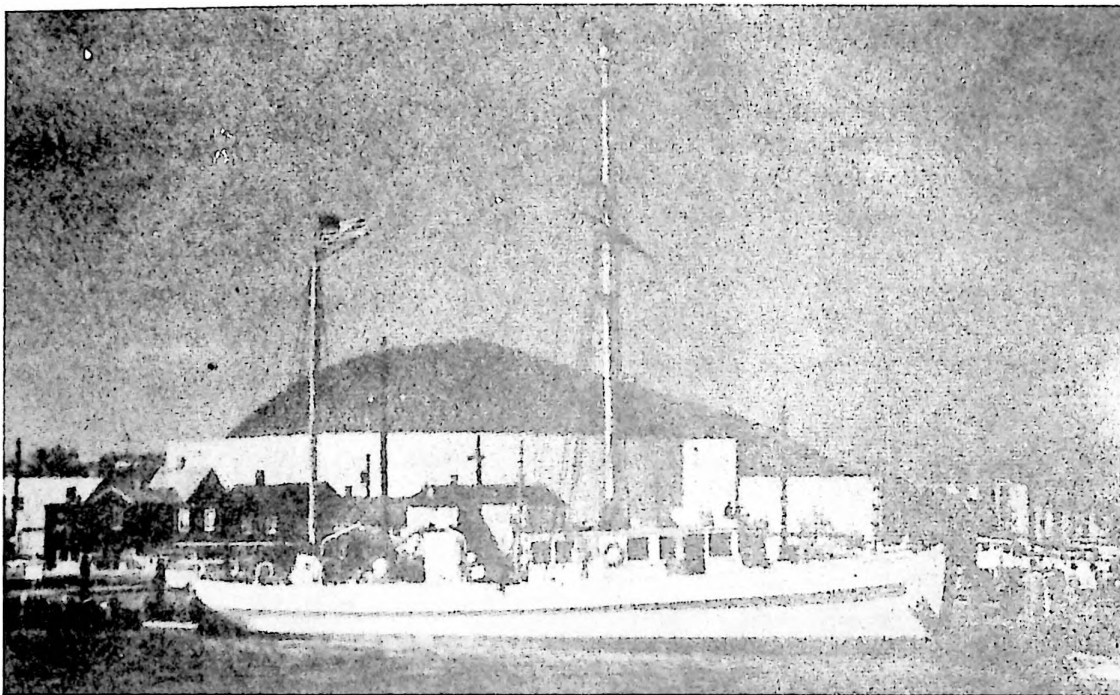
Carries 100,000 lbs. of powder for seismic work. All types of special electronic, recording and processing gear, including 24 channels of full range Series 7000 amplifiers and magneDISC, oscillographs and Seismic Underwater Explorer (SUE).

## TYPE OF OBSERVATIONS

Specifically outfitted for geophysical exploration (gravity, magnetic, seismic) but can perform all oceanographic disciplines (physical, biological and geological). Has a 26-foot launch equipped with seismic amplifiers and magnetic recorders aboard, for work close inshore. Both the TEXIN and the SONIC can perform an entire seismic operation independently, from surveying to shooting and recording.



# THE EARL OF DESMOND



TYPE: Motor Ketch.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
	90'	20'	10.5'			

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
10			2,000 miles	30 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
6	8

## **AFFILIATION**

The Geraldines Ltd. 90 Compromise Street, Annapolis, Maryland.

## **PROPULSION**

Has 200 HP diesel engine. Sails available.

## **ELECTRICAL POWER**

Has 10 KW 110V DC diesel generator; 15 KVA 120V AC diesel generator; 235 amp.-hr. 120V DC battery bank. Converters, transformers and rectifiers.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass, magnesyn compass, magnetic compass, automatic pilot, radar, loran, direction finder, consolan, pelorus, stadimeter, celestial navigation equipment, anemometer, 15" search-light.

Communication - Single side band transceiver, radio marine telephone, citizens band transceiver, communication receiver.

Echosounder - Deep sea and shallow fathometer.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Deep sea instrument winch, 15,000 ft. multi conductor cable, anchor windlass with 3000 lb. double drum, BT winch with 1,000 lb. single drum, various power capstans, stern davits for streaming instruments, amidship cargo davits, 15 ft. and 35 ft. cargo boom.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

No information.

## **HABITABILITY**

Air-conditioning, heat, fresh water showers.

## OTHER FEATURES

Deep freeze, and 250 lbs. air pressure system.

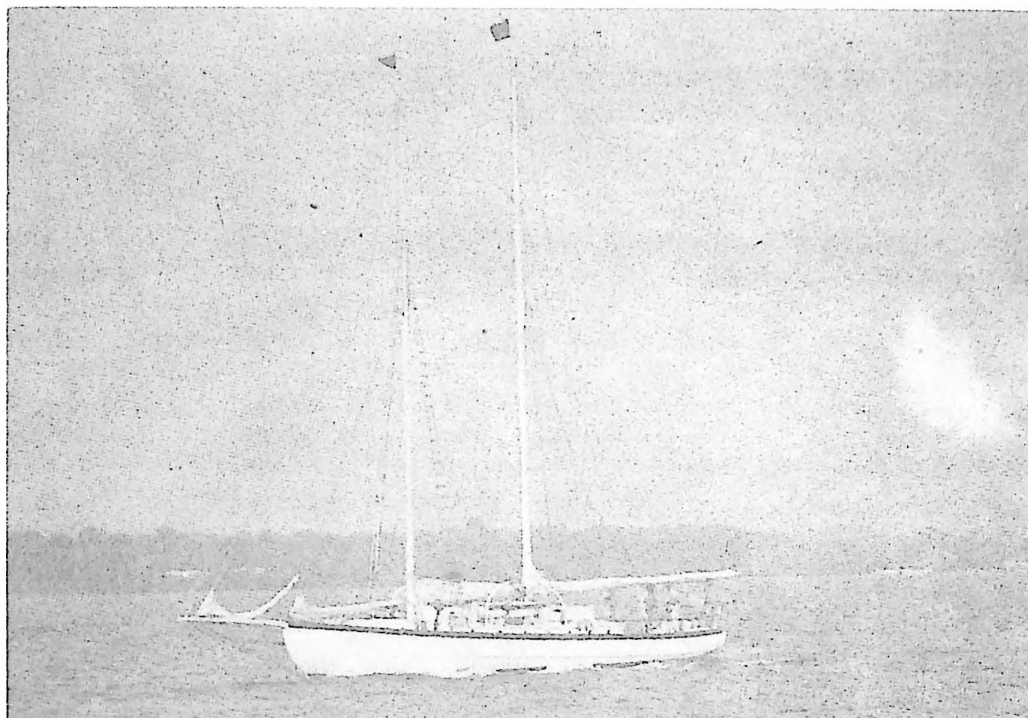
## TYPE OF OBSERVATIONS

Electro-acoustics, underwater sound, oceanography and instrumentation.

## REMARKS

Ship carries 20' inboard launch, 12' outboard, 2 life rafts. The inventory of each vessel of the Geraldines Ltd. includes audio signal generator, 1/3 octave analyzer, narrow band analyzer, level recorder, vacuum tube voltmeters, monitory hi-fi speaker system, driver amplifier (100W), preamplifiers (various), standard accelerometers (various), oscilloscope, monitary scope, 4 channel tape recorder, 4 channel live amplifier and alternator, PQM sound measuring set, BT, water sampler, tipping thermometer, sound velocity meter, barometer.

# THE EARL OF KILDARE



TYPE: Auxiliary Schooner.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
	65'	16'	5'			

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
9			750 mi. w/engine. unlimited w/sails.	15 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
3	4

## **AFFILIATION**

The Geraldines Ltd. 90 Compromise Street, Annapolis, Maryland.

## **PROPULSION**

Diesel, 135 HP, single screw. Sails also available.

## **ELECTRICAL POWER**

Has 3 KVA 110V AC diesel generator, 120V 235 amp.-hrs. battery bank, converter, and rectifier.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Magnesyn compass, spherical compass, automatic pilot, direction finder, consolan, loran, radar, pelorus, range finder, and celestial navigation equipment.

Communication - Single side band transceiver, radio marine telephone, citizens band transceiver, and communication receiver.

Echosounders - Deep sea and shallow fathometer.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

BT winch, instrument winch with 3,000 ft. multi-conductor cable, electric windlass, 1000 lb. stern davits for streaming and cargo handling, amidships davits (port and starboard), heavy equipment cargo boom.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

No information.

## **HABITABILITY**

Air-conditioning, hot water heater.

## **OTHER FEATURES**

Deep freeze, instrument racks.

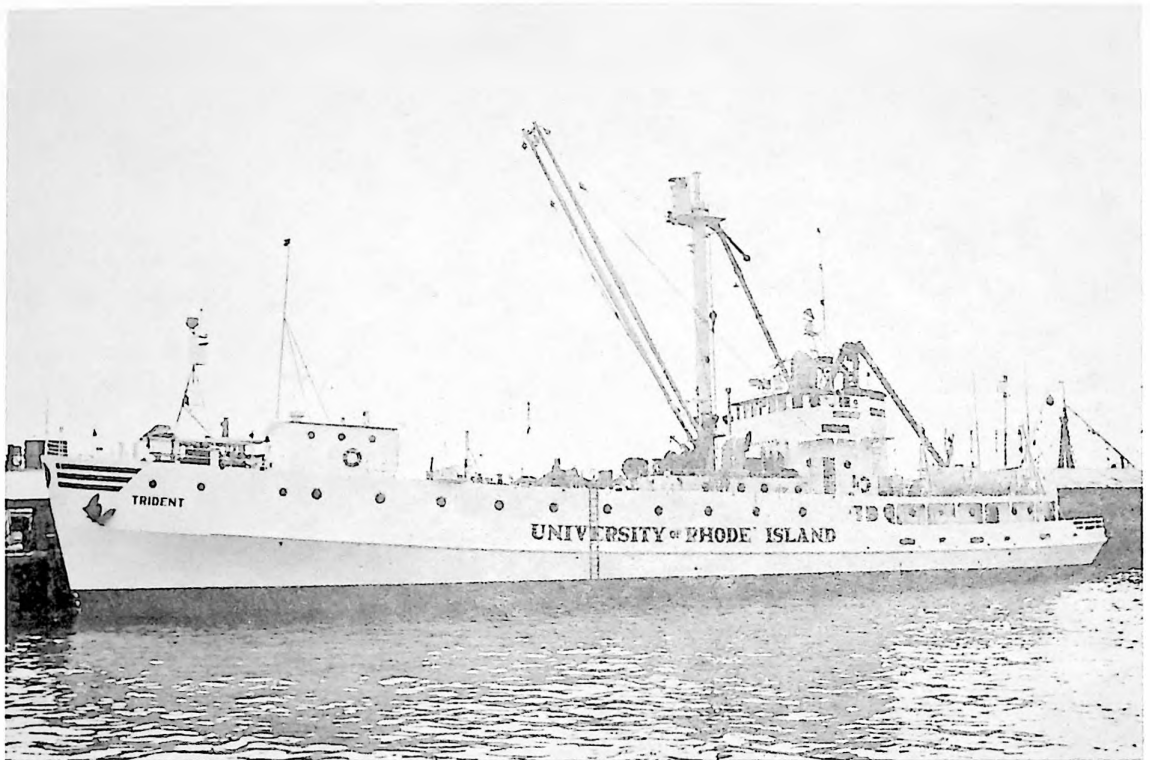
## TYPE OF OBSERVATIONS

Electro-acoustics, underwater sound, oceanography and instrumentation.

## REMARKS

Vessel carries two 8' dinghies with outboard motors, and one inflatable life raft.

# TRIDENT



**TYPE:** FS-206, steel hulled, former U. S. Army Maintenance and Supply Vessel.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1944	180'	32'	10'		856	

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
12	13	5	7,500 miles	30 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
18	13

## **AFFILIATION**

Narragansett Marine Laboratory, University of Rhode Island.

## **PROPULSION**

Two G.M. diesel engines of 500 HP each. Two fixed blade screws. Fuel capacity 38,000 gal. Uses diesel oil No. 2.

## **ELECTRICAL POWER**

Ship generates 200 KW with two 100 KW diesel generators. Normal operation requires 50 KW. Available voltages are 230V and 115V DC and 110V AC, 60-cycle, single phase.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass with repeaters, magnetic compass, radar, loran.

Communication - Northwest instrument 250W radio-telephone and CW.

Echosounders - On the bridge: Raytheon, chart feed, 0-200 fms. In the laboratory: EDO model 185 records directly on chart paper (0-600 ft., 0-600 fm., 0-6,000 fm.) and visually on oscilloscope (0-100 ft., 0-100 fm.). Alpine Precision Echo Sounder Recorder (PESR) used in conjunction with EDO to give extremely accurate record of depths (0-100 fm., 0-400 fms., 0-4,000 fm., all scales repetitive).

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One Markey hydrographic winch with 25,000 ft. of 3/16" wire. One special winch with either 15,000 ft. of .32" double conductor armored cable or 13,500 ft. of 3/8" steel cable. BT winch has 2,000 ft. of 1/8" wire.

## **ACOUSTICAL CHARACTERISTICS**

Not equipped for quiet ship operations.

## **LABORATORIES**

Main laboratory of 2,000 sq. ft. of space is forward and has fresh water, salt water and electrical taps. A small wet laboratory directly above opens on the weather deck. An elevator connects the two.



## **HABITABILITY**

Ship is ventilated both naturally and mechanically. Ship is heated for work in winter in temperate zones. Fresh water capacity is 7,000 gal. Distillation apparatus produces 800 gal./day.

## **OTHER FEATURES**

All laboratories and winches are forward of the bridge. Gear is worked overboard from amidships. Design of ship permits large hold capacity which is reached through cargo hatch from main deck and/or main lab. A scientific walk-in type reefer is in hold. Facilities for four women scientists are built in. Has ammunition storage of 5 tons capacity.

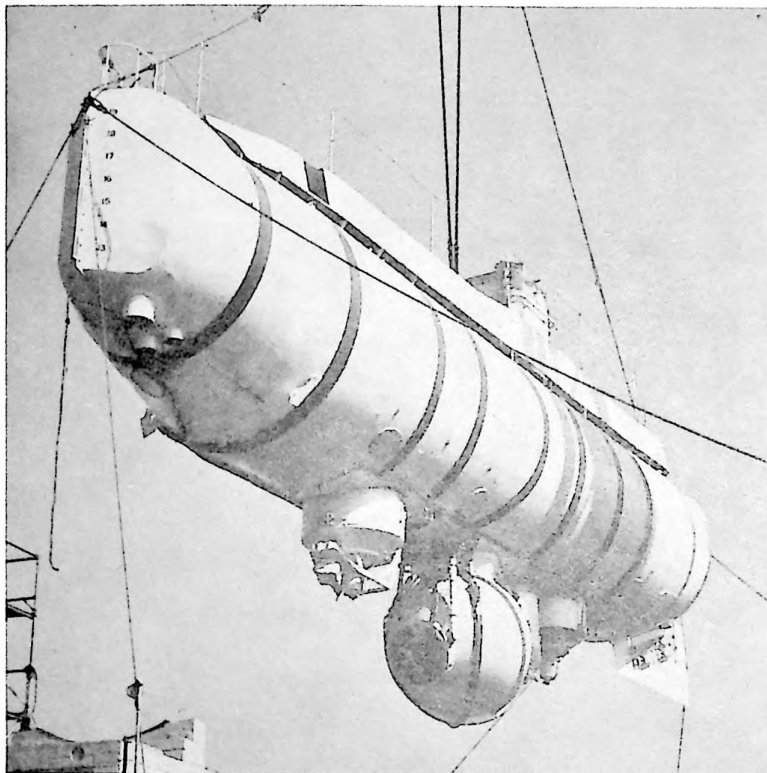
## **TYPE OF OBSERVATIONS**

Hydrographic casts and biological, geological, geophysical and chemical work of various types.

## **REMARKS**

None

# TRIESTE



**TYPE:** Bathyscaph Deep Submersible Research Craft.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1953	60'	12 1/2'	18'	150 tons	150 w/gasoline	50 empty

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
	4 (towing speed)		2,000 yards	24 hours

## COMPLEMENT

CREW	SCIENTIFIC STAFF
1	1

## **AFFILIATION**

U. S. Navy Electronics Laboratory, San Diego 52, California.

## **PROPULSION**

Equipped with 5 small 3 HP DC pressure-compensated motors for limited horizontal movement on sea floor. Five propellers: two vertical, one turning, and two horizontal. Battery propulsion system consisting of 66 12V lead acid storage batteries carried outside the bathyscaph. Estimated operating range on the sea floor is about 2,000 yards.

## **ELECTRICAL POWER**

Has 33 KW hours of 24V DC supply. Also 1,000W AC power available for instrumentation. Power characteristics: 24V AC, and 110V, 115V, 60-cycle, 1,000W. Additional small DC or AC may be furnished as program requires.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Directional gyro, depth indicators, and fathometer.

Communication - Underwater telephone, can communicate with surface vessel so equipped.

Echosounders - One small 200 fm. echosounder.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Not applicable.

## **ACOUSTICAL CHARACTERISTICS**

Especially adapted to making insitu sound velocity profiles from surface to bottom.

## **LABORATORIES**

Not applicable.

## **HABITABILITY**

Normal operation is 4 to 6 hours but endurance may be extended to 24 hours.

## OTHER FEATURES

Only submersible vessel of its kind.

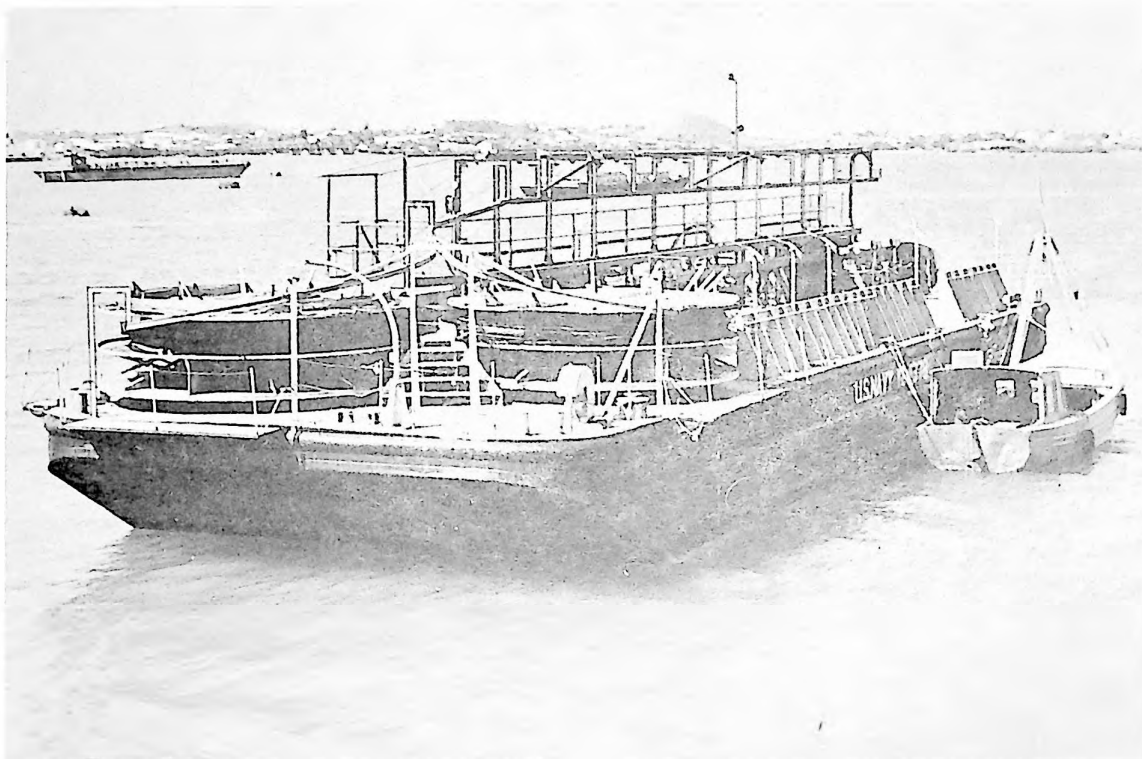
## TYPE OF OBSERVATIONS

Observer can make insitu observations of deep ocean environment and carry several tons of equipment to measure a wide variety of variables at any point in water column. Craft has no depth limitations. Primary feature is that a trained mind and eye can observe the dynamics of the environment at first hand. Besides sound velocity profiles, complete temperature profiles, water samples and plankton may be obtained. The bathyscaph workboat is equipped with a BT winch with 1,000 ft. wire.

## REMARKS

Bathyscaph was built in 1953 at Castelamare di Stabia, Italy, and purchased by U. S. Navy in 1958. It is a Bureau of Ships activity. Vessel designed and built by Auguste and Jacques Piccard. Scientific equipment includes flood lamps, cameras with electronic flash, a mechanical arm for selective sampling, and a closed circuit TV. Vessel is a partitioned steel float which holds about 33,350 gal. of high test gasoline in its 11 compartments, providing buoyance according to program requirements. Vertical movement is controlled by releasing quantities of the 16 tons of iron pellet ballast carried in two containers at a rate of about 1 ton per 3,000 ft. of descent. The vessel is held at the bottom by the remaining ballast and will ascend when this is released. Has the distinction of making the deepest descent ever made, 10,910 meters into the "Trieste" depth.

# YC-1378



TYPE: Barge - Cable laying.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1954	110'	34'	3'6"	110 tons		

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		

## \* COMPLEMENT

CREW	SCIENTIFIC STAFF

\* None permanently assigned. Manned as needed by T-426 crew and station personnel.

## **AFFILIATION**

Owned by U.S. Navy. Operated by Columbia University Geophysical Field Station, Bermuda.

## **PROPULSION**

None

## **ELECTRICAL POWER**

Has three generators: 30 KW DC diesel generator; 2 1/2 KW AC motor generator; 30 KW AC diesel generator, 110/220V 60-cycle, 220/440V 50-cycle.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation: None

Communication: TCS-12 transceiver

Echosounders: None

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

This barge was converted in 1959 at a cost of \$200,000 to a cable layer to lay hydrophone arrays. Two hydraulic driven winches are located at the stern, one with diameter of 16 ft., the other 18 ft. They may be operated one at a time and have a pulling power of 9,000 lbs. Cable is led down the centerline to the bow sheave between two rows of rotating drums which are moved in and out hydraulically to act as brakes. An overhead track is installed to carry attached hydrophones.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

None - but plenty of space and power available below deck.

## **HABITABILITY**

Bunks, messing facilities and head have been installed. Topside flood-lighted for night work.

### OTHER FEATURES

None

### TYPE OF OBSERVATIONS

Any operation involving lowering equipment to, or raising it from, the ocean floor. The capabilities of this barge are such that it can handle many types of jobs requiring a high capacity winch with a high line pull.

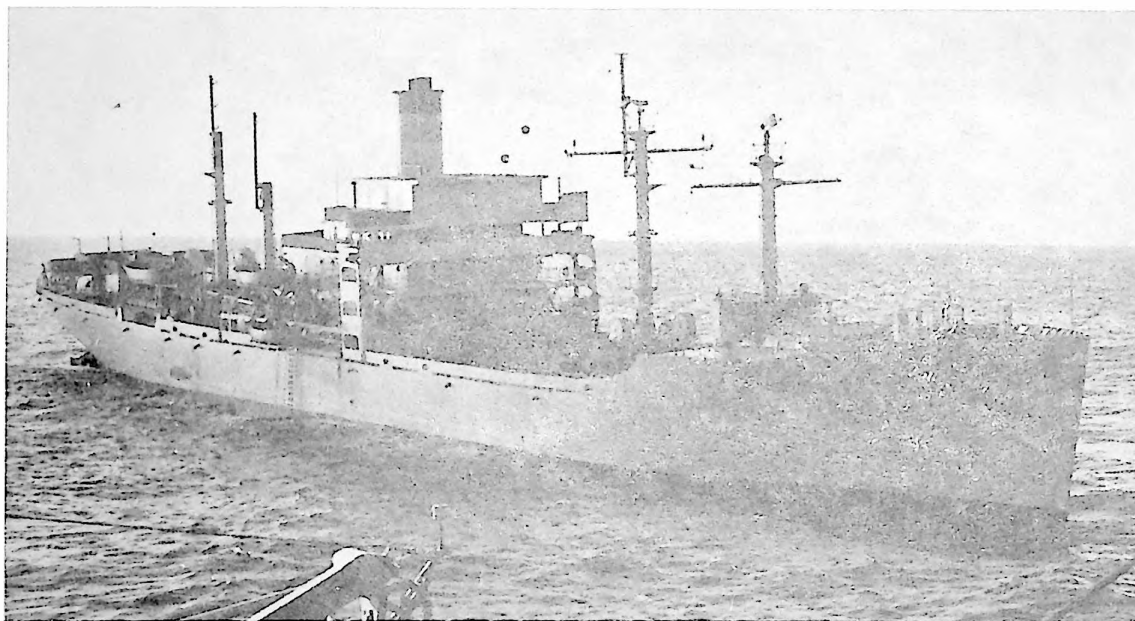
### REMARKS

This barge is available on charter to U.S. Government laboratories and contractors.

BOWDITCH

DUTTON

MICHELSON



**TYPE:** Largest class Oceanographic Survey Ships; T-AGS-21, T-AGS-22 and T-AGS-23, converted from VC-2 Victory Class Cargo Ships designed as high speed steel hulled freighters.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1944-1945 Converted 1958	454'	62'	31' fully loaded	15,199 tons fully loaded	7,600	4,500

### PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
17.5	19	5	24,000 miles	75-90 days
Bowditch somewhat slower				

### COMPLEMENT

CREW	SCIENTIFIC STAFF
Up to 59	Up to 47



## **AFFILIATION**

Operated by MSTIS under technical control of the U. S. Naval Oceanographic Office, Washington 25, D. C.

## **PROPULSION**

Steam turbines delivering 8,500 HP drive a single screw. Fuel oil capacity 19,023 barrels.

## **ELECTRICAL POWER**

Utilizes latest methods in design, installation and materials. Three 300 KW 120/240V DC turbogenerator sets, one diesel driven 60 KW 120/240V DC emergency generator, three 50 KW DC/AC 450V 3 phase 60-cycle motor generators and two 25 KW 230V DC/450 AC 3 phase 400-cycle motor generator sets.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Two loran C receivers; Decca; SINS with automatic position plotter system; optical star tracker; Jog Log system; underwater log; doppler sonar (on AGS-23 only); gyro pilot; gyrocompass system; infrared; radiac; two navigational radar units; recognition radar unit; three precision depth recorders, MK 7 in NIC, MK 7 and MK 6 in SCC; direction finder, 210-520 KC; two marine navigational magnetometer systems; two tape punch recorders; two analog strip chart recorders and an assimilation computer.

Communication - Transmitters: 350-600 KC, CW and modulated CW, 200 mile range; 350-600 KC, modulated CW, 100 mile range; 2-24 MC, CW, 1,000 mile range; 2-3 MC, voice, 50 mile range and two 225-400 MC, voice, manual shift - Receivers: 14-650 KC, CW; 350-600 KC, modulated CW; 2-25 MC, CW; 2-3 MC, voice; 225-400 MC, voice and an automatic alarm keyer.

Echosounders - Two precision echosounders with three transducers and one stabilized narrow beam unit.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Two drum Jog Log and magnetometer winch, 2,000 lb. pull at 100 ft./min. capacity 1,200 ft. of 0.9" cable. Two 5 ton cargo winches P/S and additional winches as needed for oceanographic observations.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## LABORATORIES

Survey control center, naval and scientific office, gravity meter room, sonar room, photographic laboratory, print shop, white print shop, machine shop. Large cargo areas may be modified for any type of laboratory.

## OTHER FEATURES

Air-conditioned. Provides maximum comfort and dependability. Living conditions for enlisted staff personnel are the finest in the Navy, consisting of two and four man, officer-type staterooms with connecting showers, high fidelity receivers, and stewards for 1st class and chiefs. Food in quantity, quality and variety is very good. Has a 6-man sickbay with chief hospitalman, ships store, laundry, library, recreation equipment and movies each evening. Fresh water stowage capacity 421 tons, evaporator capacity 29.7 tons/day. Degaussing equipment, sound-powered telephone system, two 12 inch signaling searchlights, two 500W floodlights on bridge and two towing lights. Michelson has a thermistor chain.

## TYPE OF OBSERVATIONS

Bathymetry, gravity, magnetism, surface and sub-surface temperatures, salinity, ocean currents, sea ice limits, ocean waves and surface observations of meteorological conditions, and VLF propagation studies.

## REMARKS

Bowditch is named after Nathaniel Bowditch, a self educated ship master born in 1773, who found so many errors in the latest navigation tables that he wrote the "New American Practical Navigator," which has become a world reference standard.

Dutton is named after Captain Benjamin Dutton, Jr. who served the Navy in many important assignments. He is best remembered as the author of "Navigation and Nautical Astronomy" used as a text book at the Naval Academy and in the Merchant Marine.

Michelson is named after Albert Abraham Michelson, a U. S. Physicist born in Germany in 1852, who invented an interferometer to discover the effect of the earth's motion on the velocity of light.



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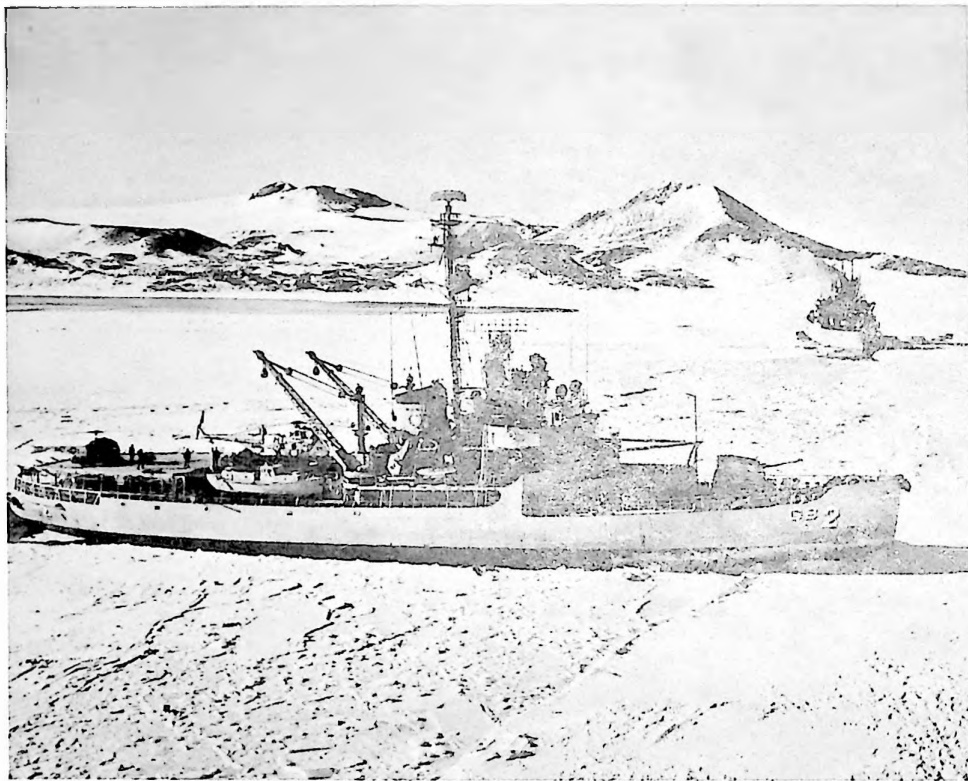
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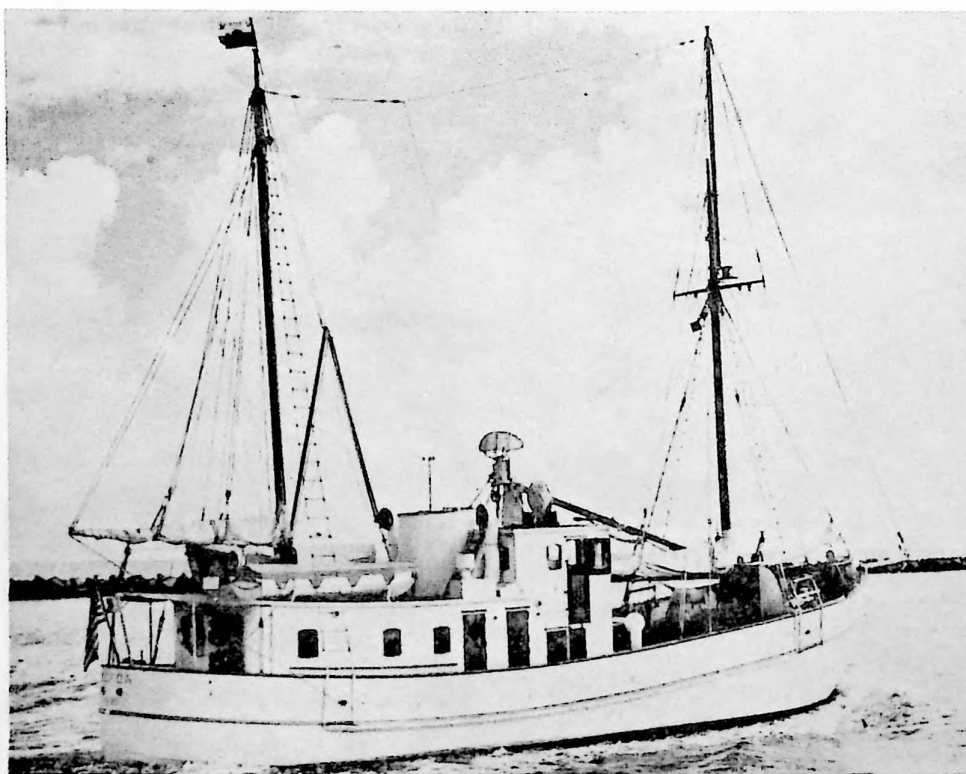
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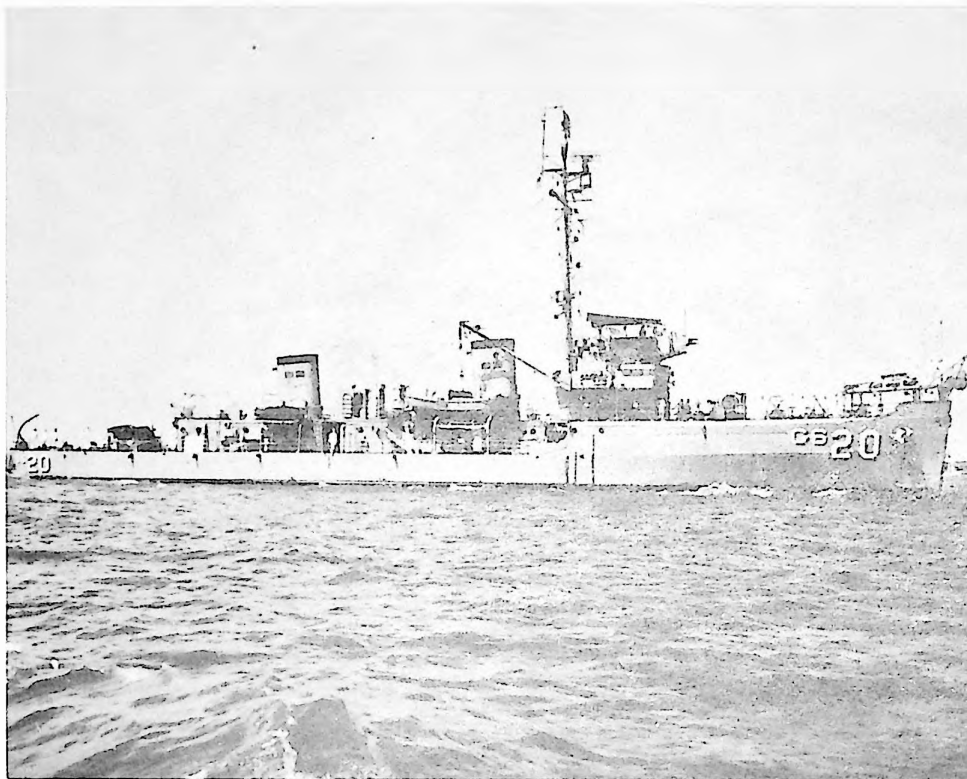
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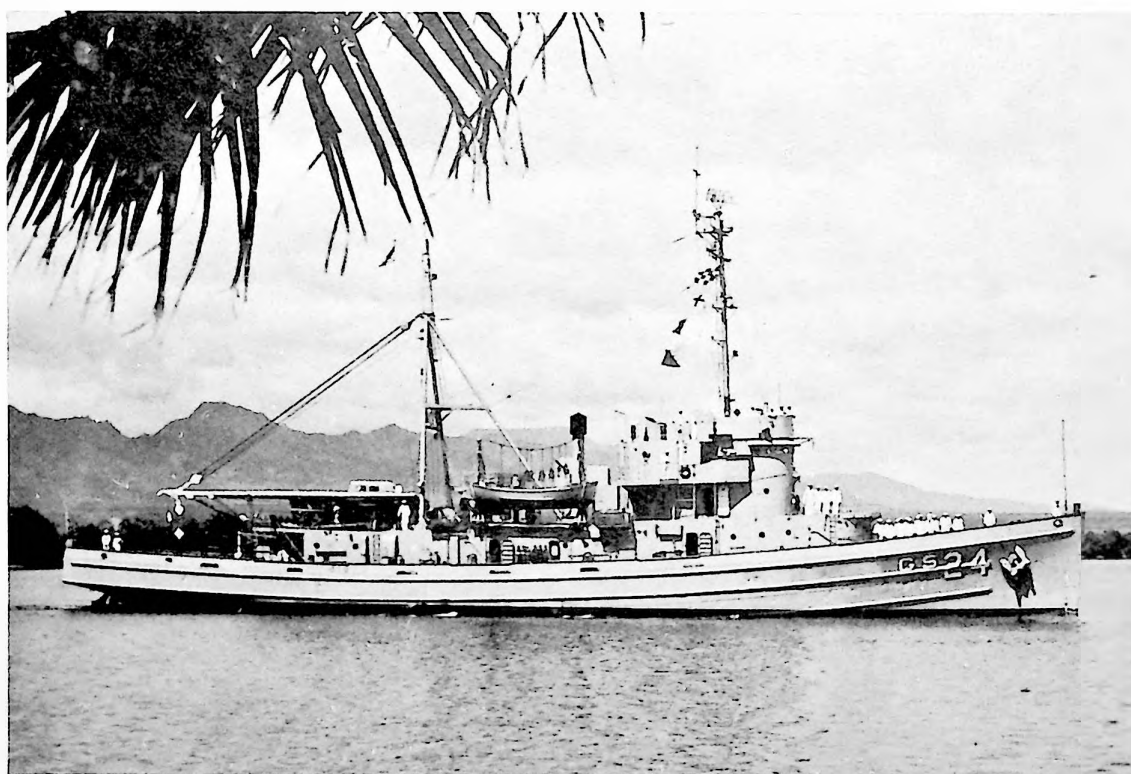
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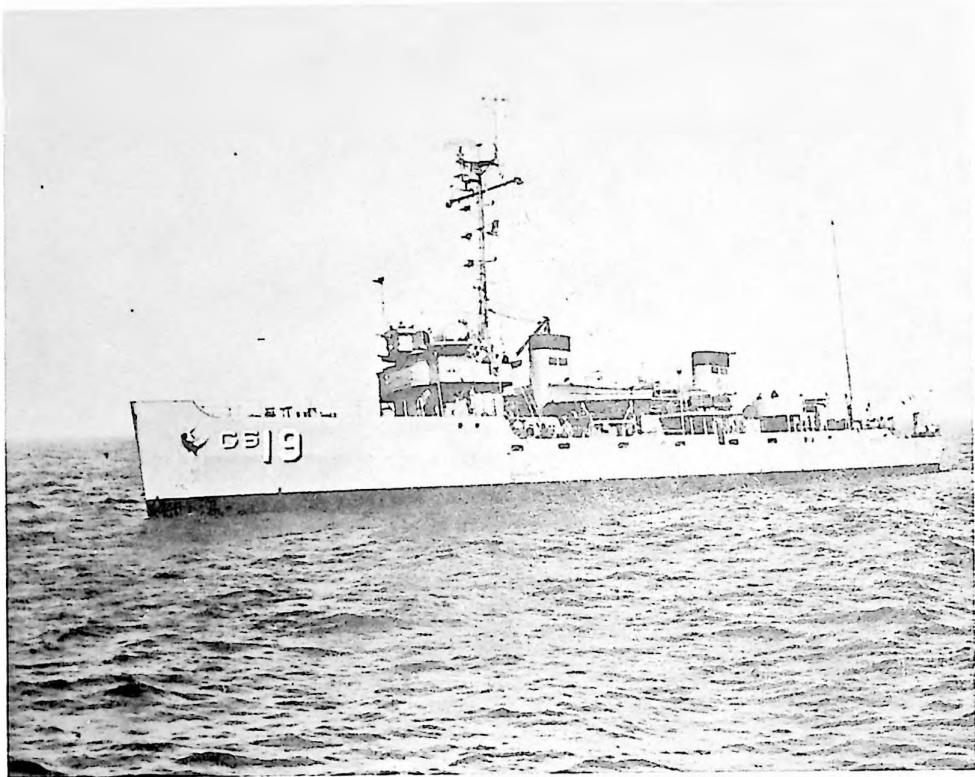


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SERRANO, paste on page 62.97

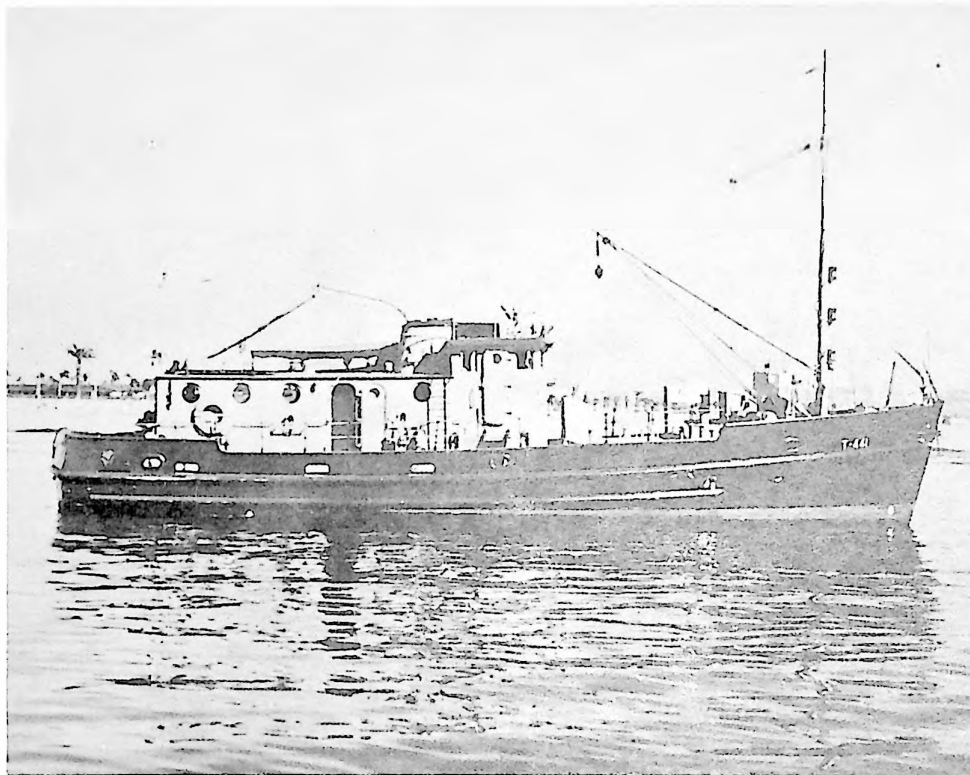




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STATEN ISLAND, paste on page 62.106

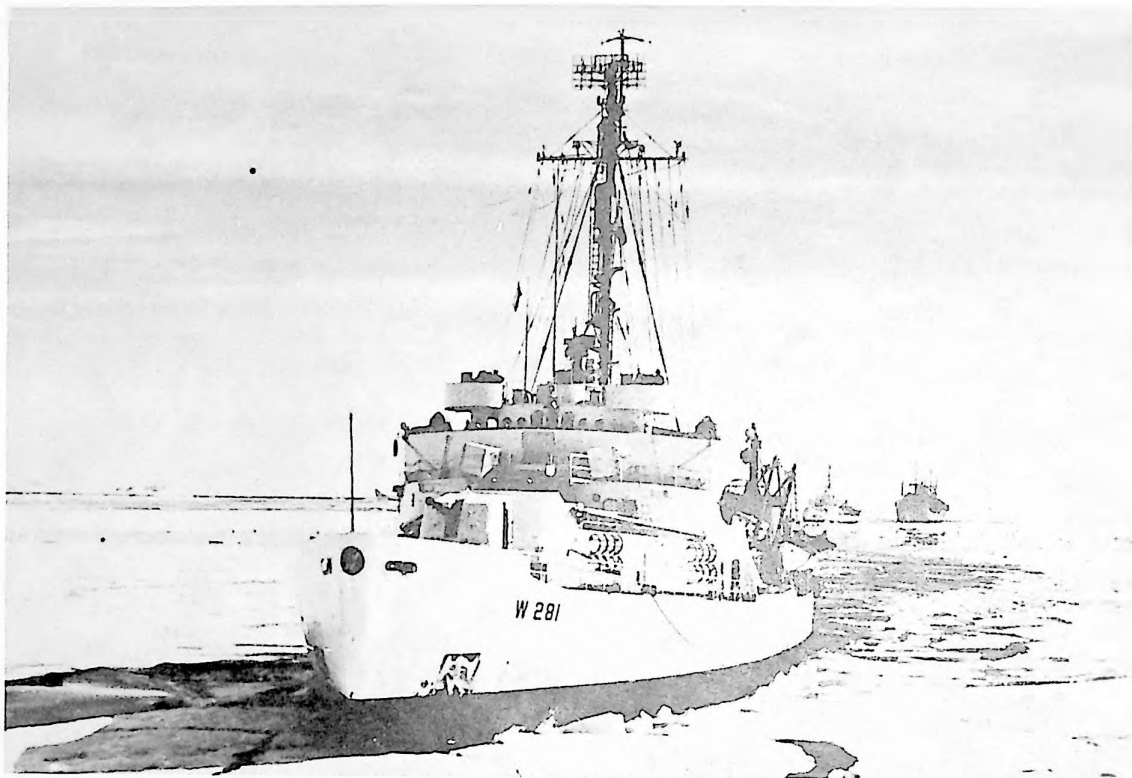


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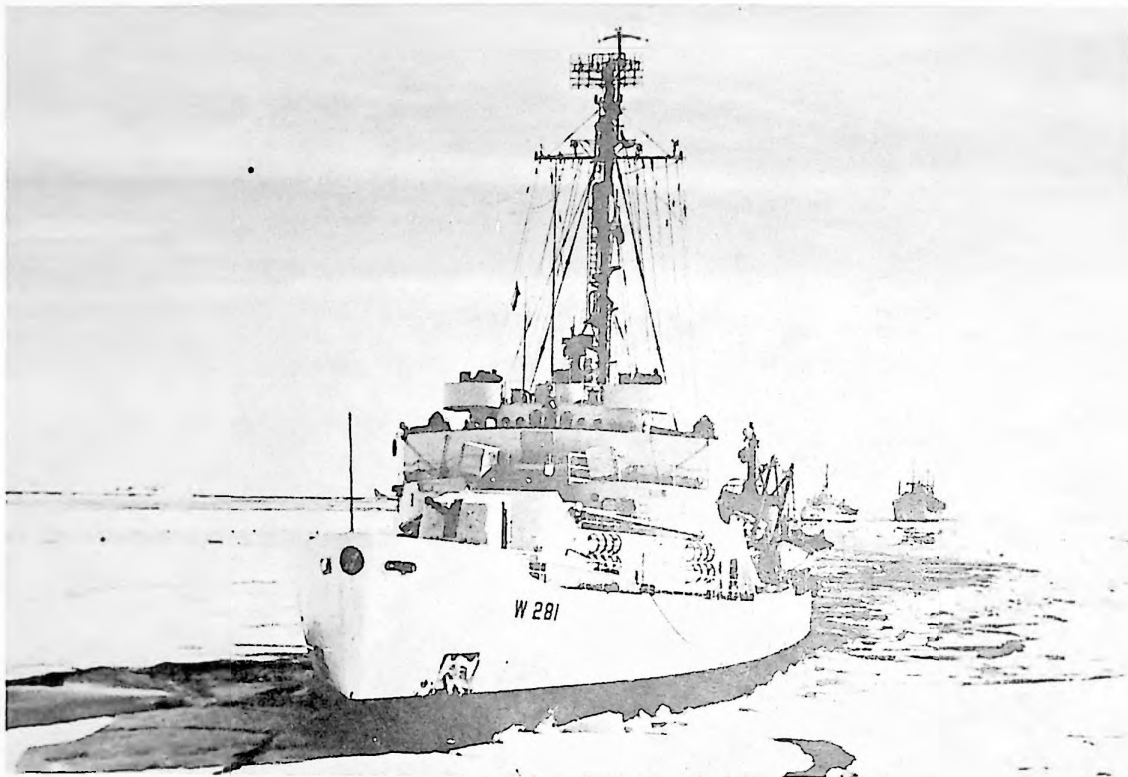


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# YUGOSLAVIA

SECTION 66

# M. B. BIOS



**TYPE:** An adapted Fishing Boat, wooden construction.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1950	11.6 m.	3.5 m.	0.8 m.		9.2	4.0

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
5	6	1.5	120 miles	1 day

## COMPLEMENT

CREW	SCIENTIFIC STAFF
4 (Total)	

## **AFFILIATION**

Bioloski Institut, Rovinj.

## **PROPULSION**

Two-cylinder, diesel motor (Aran), single-screw, 24 HP. Uses light fuel oil; carries 80 kilograms and uses about 4 kilograms/hr.

## **ELECTRICAL POWER**

Has 24V DC from batteries for scientific work.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Steering compass and usual equipment for coastal navigation.

Communication - None.

Echosounders - None.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

One light oceanographic winch (type Kelvite), and one small hand winch.

## **ACOUSTICAL CHARACTERISTICS**

Good.

## **LABORATORIES**

None.

## **HABITABILITY**

No heating or cooling. Has no fresh water tanks or distillation apparatus.

## **OTHER FEATURES**

No antirolling devices. Can make observations up to Sea State 3 or 4.

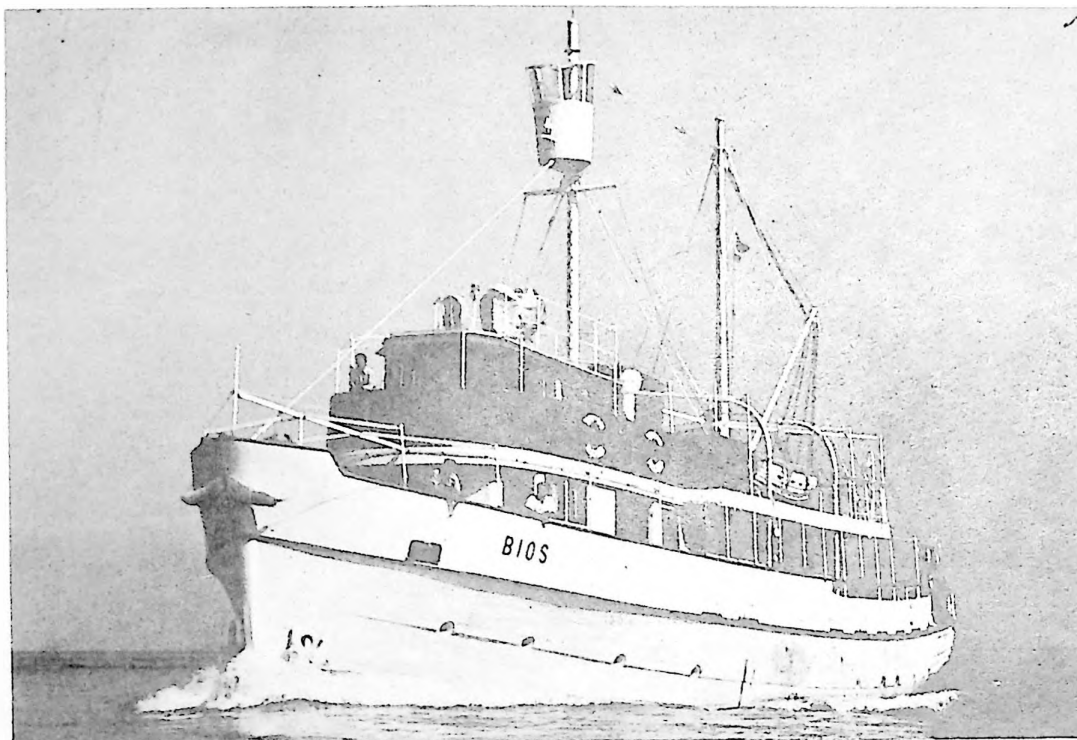
**TYPE OF OBSERVATIONS**

Hydrographic casts, bottom sampling (coring, dredging); nearshore only.

**REMARKS**

None.

## M. V. BIOS



**TYPE:** Cutter, originally designed and built as Research Ship, wooden construction.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1953	27.7 m.	7.2 m.	3.0 m. (full)		161.9	73.6

### PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
9.0	10.3	1.5	2,600 miles	12 days

### COMPLEMENT

CREW	SCIENTIFIC STAFF
7	10

## **AFFILIATION**

Institute of Oceanography and Fisheries, Split.

## **PROPULSION**

Diesel motor (Burmeister and Wain), five cylinders, single screw with reversible blades, 300 HP. Uses light fuel oil; capacity 16,000 kilograms; total consumption steaming about 55 kilograms/hr.

## **ELECTRICAL POWER**

Ship generates 5 KW and uses this amount for normal operations. Batteries supply additional 5 KW for scientific work. Currents available: 110V DC, 5 KW, and 24V DC from two batteries of 220 and 440 amp.-hrs.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Standard compass, steering compass, sextant, chronometer, and other equipment.

Communication - Radio-telephone (Lagier RA50), Morse lamp, and international code system.

Echosounders - Elac echograph, range 1,800 m.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Two light oceanographic winches (type Kelvite) with 1,000 m. of 1.5 mm. wire. One heavy winch (Vulkan Rijeka), two drums, with 1,200 m. of 12 mm. wire. One windlass (Vulkan Rijeka) for anchoring and long-line fishing.

## **ACOUSTICAL CHARACTERISTICS**

Has good acoustical characteristics. Can be put in noiseless condition; lighted by 24V DC from batteries.

## **LABORATORIES**

Main deck laboratory (33 cu. m.) and lower deck laboratory (39 cu. m.); each has 100 and 24V DC, and running sea and fresh water.



## **HABITABILITY**

No air-conditioning or heating. Carries 7 tons of fresh water; no distillation apparatus; has salt water showers.

## **OTHER FEATURES**

Has aquarium (80 liters capacity), a scientific freezer (6 cu. m.) and a dark room. Has permanent ballast of 2 tons of gravel for antirolling. Oceanographic observations possible up to Sea State 4 or 5.

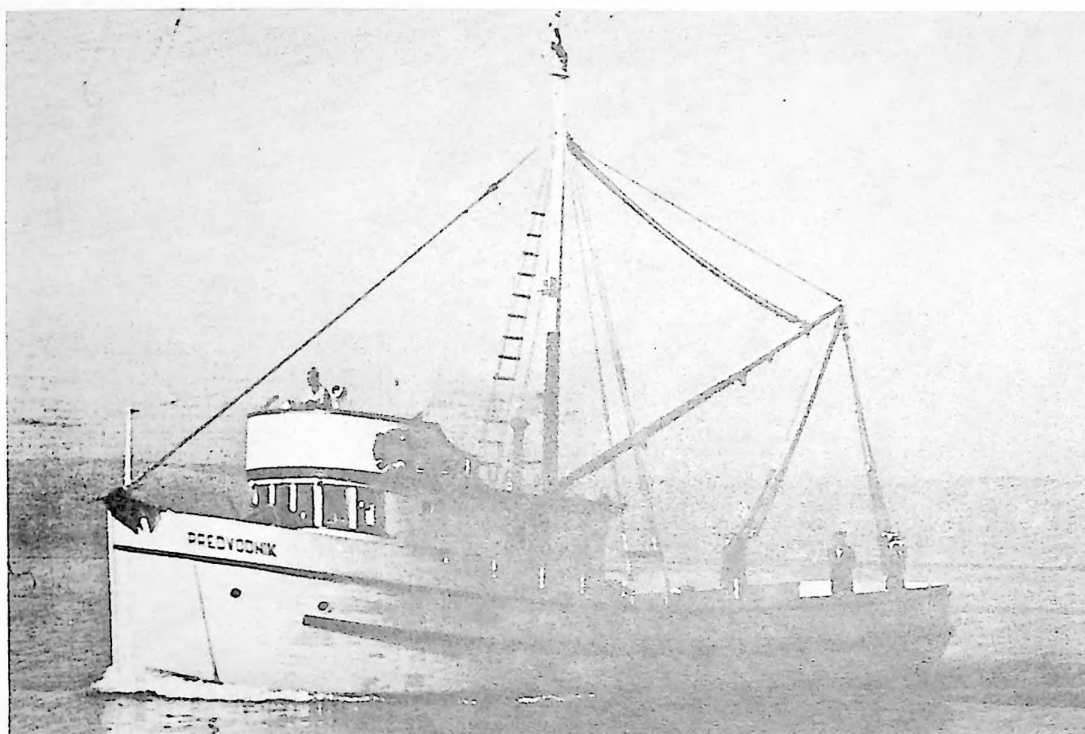
## **TYPE OF OBSERVATIONS**

Hydrographic casts, bottom sampling (coring, dredging), trawling, underway soundings, plankton tows, and long-line fishing.

## **REMARKS**

None.

# PREDVODNIK



**TYPE:** An adapted Fishing Vessel (ex-ALDONA Seattle, Washington, U.S.A.), wooden construction.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1945	18.2 m.	5.0 m.	2.1 m.		54.2	20.5

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
8	9.5	1.5	3,200 miles	16 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
7	4

## **AFFILIATION**

Institute of Oceanography and Fisheries, Split.

## **PROPULSION**

Six-cylinder diesel motor "Gray Marine," single screw, 165 HP. Carries 8,000 kg. of light fuel oil. Total consumption about 20 kg./hr. steaming.

## **ELECTRICAL POWER**

Ship generates 5 KW, and uses this amount for normal ship operations. Has 5 KW for scientific work from batteries. Has 36V DC current available.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Standard compass, steering compass, radio direction finder, and other equipment for coastal navigation.

Echosounders - Simrad (Simonsen-Radio A/S Asdic Sounder, Oslo, Norway) horizontal range 500 m., vertical range 120 m.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Two light oceanographic winches (type Kelvite) with 1,000 m. of 1-1/2 mm. wire each. One heavy winch, two drums, each with 800 m. of 10 mm. wire. One windlass and one anchor winch with 150 m. of 18 mm. wire.

## **ACOUSTICAL CHARACTERISTICS**

Ship has good acoustical characteristics. Can be put in noiseless condition. During night hours ship lighted by 36V DC from batteries.

## **LABORATORIES**

None.

## **HABITABILITY**

No air-conditioning or heating. Carries 6 tons of fresh water; no distillation; salt water showers available on open deck.

### OTHER FEATURES

Has transportable tank for live fish (1,575 liters capacity). Has permanent ballast of cement blocks to reduce rolling. Can make observations up to Sea State 4.

### TYPE OF OBSERVATIONS

Hydrographic casts, bottom sampling (coring, dredging), underway soundings, plankton tows, and long-line fishing.

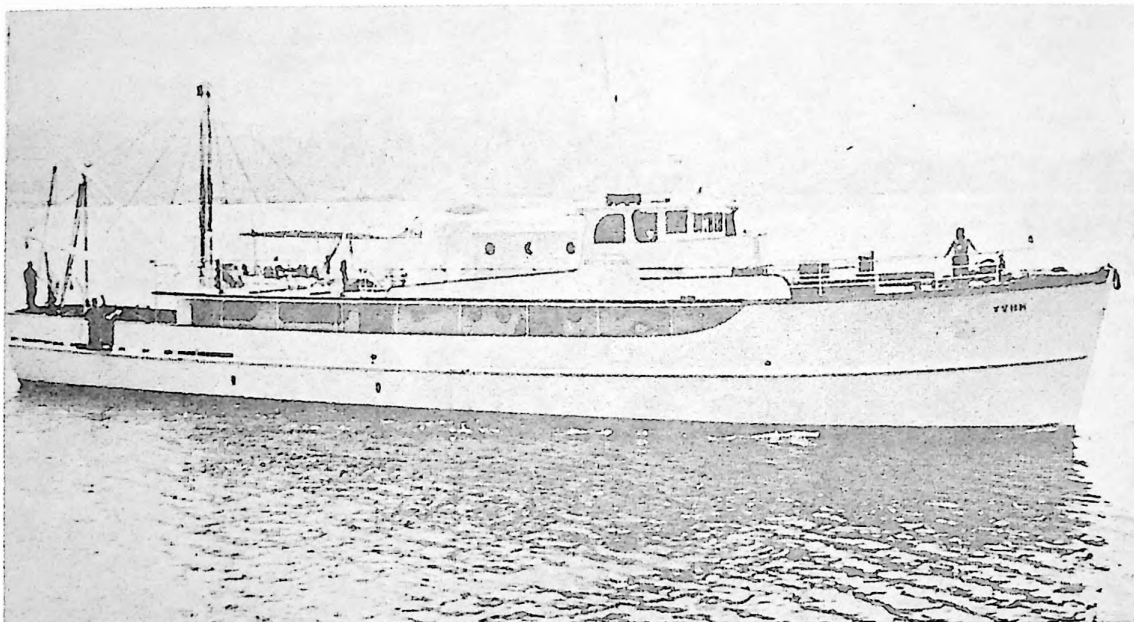
### REMARKS

None.

**VENEZUELA**

**SECTION 64**

# GUAICAUERI



**TYPE:** Wood hulled motor ship.

YEAR BUILT	LENGTH	BEAM	DRAFT	DISPLACEMENT	TONNAGE	
					GROSS	NET
1943	136'	24.5'	11.4'			

## PERFORMANCE

SPEED (knots)			RANGE	ENDURANCE
CRUISING	MAXIMUM	MINIMUM		
6	10		1,200 miles	5 days

## COMPLEMENT

CREW	SCIENTIFIC STAFF
11	4 to 6

## **AFFILIATION**

Instituto Oceanografico, Unversidad de Oriente, Cumana, Venezuela.

## **PROPULSION**

Has two 500 HP diesels, twin fixed pitch propellers. Carries 26.6 tons fuel oil.

## **ELECTRICAL POWER**

Generators provide 110V AC and 110V DC at a total power output of 90 KW.

## **NAVIGATION, COMMUNICATION, AND ECHO SOUNDING EQUIPMENT**

Navigation - Gyrocompass

Communication - RCA Model ET 8012-D radio.

Echosounders - EDO, 12 KW, range 6,000 fms.

## **HYDROGRAPHIC WINCHES AND EQUIPMENT**

Hydrographic winch (electric), speed 1,000 m./min.

## **ACOUSTICAL CHARACTERISTICS**

No information.

## **LABORATORIES**

Space above deck 12 sq. m., on deck 54 sq. m., below deck 114 sq. m.

## **HABITABILITY**

Generally works in tropical areas. Carries 15 tons of fresh water.

## **OTHER FEATURES**

Has an antirolling keel.

**TYPE OF OBSERVATIONS**

Meteorological, oceanographic and biological observations; hydrographic survey.

**REMARKS**

Generally works in the Caribbean Sea.



SECTION 100



## G L O S S A R Y

Aft - Toward the stern; near the stern.

Amidships - Middle part of a ship, or a middle line in her - either fore and aft or athwartships.

Anschutz Gyrocompass - German type in which three gyros revolve in air. Sensitive element floats in a mercury bath. Damping is effected by oil.

Asdic - Device for detecting underwater objects and ascertaining their distance and direction, by making a sound signal in water and timing intervals until return of echo. Name taken from "Allied Submarine Devices Investigation Committee" of World War I.

Beam - The greatest width of a ship.

Between Perpendiculars (b.p.) - Distance between fore side of stern and after side of stern post when measured along summer load line.

Bilge Keel - External keel placed along bilge of a steel ship. Assists in stiffening, protects plating from stresses when on ground and reduces rolling at sea. Generally causes reduction in speed.

Boat Deck - Uppermost deck, of light construction, on which lifeboats and other life saving appliances are stored.

Bow - The forward part of a vessel.

Capstan - Vertical barrel, working on a vertical spindle that is used for heaving ropes and chain cable. May be operated by hand, steam, electric, or hydraulic engine.

Chernikeef Log - Submerged log that projects through bottom of ship. Carries an "impeller" that turns as vessel moves through water. Directly records distance run and, with electrical attachments, can indicate speed.

Cherub Log - Towed log consisting of a towed rotator, non-kinkable log line and an inboard registering unit. Measures distances directly, and can be used for speeds up to 12 knots.

Corvette - Small naval vessels for escort, patrol, and convoy duties.

Course Recorder - Mechanical aid to pilotage. A "plotter" is moved electrically over a chart and is controlled in speed and direction by electric log and gyro repeater. Recorder indicates ship's charted position at any moment.

Davit - Curved steel fittings for the support and lowering of lifeboats and heavy equipment.

Deadweight Tonnage - A measure of weight, being the difference between the displacement of the ship when she is laden and empty; i.e., the actual weight of cargo, fuel, stores, etc., that she can carry. Expressed in tons avoirdupois.

De Laval Turbine - Uncompounded turbine used for driving pumps and dynamos.

Derrick - Long spar attached to foot of mast or kingpost and used for handling cargo, etc.

Diesel Engine - Oil engine in which ignition of fuel is caused by compression. Cycle comprises air compression, fuel injection, ignition, and scavenging. Cycle may be completed in two or four strokes.

Dinghy - Small boat, about 10-14 ft. long, pulling two oars and fitted with mast and one or two sails.

D-Instrument - An instrument used to make continuous recording of water transparency in various spectral bands. Used on German vessels.

Displacement - Amount of water displaced by a floating vessel in a given condition. May be expressed in tons, or volume in cubic feet; tons being the weight of vessel and contents, volume being that of immersed part of vessel.

Displacement Ton - A unit approximately equal to the volume of a long-ton weight of sea water, used in reckoning displacement of vessels, especially war vessels; 35 cu. ft. equals one displacement ton.

Displacement Tonnage - This is the actual weight of the ship - the weight of the water she displaces. (When quoted is usually the Light displacement; i.e., without cargo, unless stated otherwise).

Draft - Depth of hull below water level.

Electric Log - Log that is electrically connected to register distance, and/or speed, at a position remote from the log.

Endurance - Number of working days at sea (drifting, heaving to, cruising, etc.); will depend upon fuel, fresh water, or provisions in different circumstances.

Fantail - A form of counter or after overhang of a vessel, which is shaped like a duck's bill.

Fathometer - Echosounder made by Submarine Signal Co. of Boston.

Fore - In or toward the bow of a ship.

Forecastle - A short superstructure situated over the bows.

Frigate - Small naval ship used for escort and patrol duties. Generally has raised forecastle and quarter deck.

Gaff-Type Sails - Four sided sails.

Gross Tonnage - Measurement of total internal volume of a vessel; includes all under deck tonnage and all enclosed spaces above tonnage deck, 100 cubic feet of space being considered as one ton.

Gyro Repeater - Electrically operated dial that is graduated as a compass and kept in step with the master gyrocompass; indicates position of gyrocompass at stations remote from it.

Hot Bulb Engine - Internal combustion engine in which ignition of fuel is assisted by having a hot bulb head in compression-combustion space.

Ketch - Sailing vessel having fore and aft rig on each of two masts.

Length - The length of the hull measured overall from tip to tip (overall) or between perpendiculars which is the distance between the after side of the rudder post and the fore side of the stem at the summer load waterline (b.p.). There are other official lengths, depending on the country of ownership.

Mast - Structure primarily used for handling derricks. Usually consists of a heavy lower mast surmounted by crosstrees above which is a lighter topmast. From forward to aft a ship's masts are (a) foremast, (b) mainmast, (c) mizzen mast, and (d) jigger mast.

Mizzen - Small sail, set on small mast, right aft in a vessel having a mainsail.

Net Tonnage - Ship measurements derived from gross tonnage by deducting spaces allowed for crew and propelling power, 100 feet of space being considered as one ton.

Opposed Cylinder Engine - Internal combustion engine having cylinders on opposite sides of each crank. Impulses are applied at twice the usual rate.

Paravane Stabilizers - Torpedo shaped stabilizers for reducing ship rolling.

Patent Log - Former name for a towed log. Cherub Log.

Pinnacle - Any of various ship's boats or launches.

Pitometer Log - Submerged log actuated by pressure set up by ship's advance through water. Speed is indicated directly; distance run is indirectly obtained by additional mechanism.

Port - The left side of a ship looking forward.

Quarter Deck - The aftermost part of the upper deck.

Radio Compass - Directional radio receiver calibrated to indicate the direction in which a radio wave approaches.

Radio Direction Finder - Instrument for detecting a radio signal and for indicating the relative bearing on which it is received.

Register Ton - A unit of internal capacity for ships; 100 cu. ft. (2.8317 cu. m.) equals one register ton.

Register Tonnage - Measurement of a ship, based on internal capacity, as entered in her Certificate of Registry. Can be Net or Gross.

Seiner - A craft built for fishing with a seine net. Generally has considerable working space aft.

Sperry Gyrocompass - Electrically driven gyroscope, revolving at 9,000 revolutions per minute that carries corrector devices for precessing it into the meridian and maintaining it there.

Starboard - The right side looking forward.

Stem - The extreme foremost part of the hull.

Stern - The extreme aftermost part of the hull.

Summer Load Line - The deepest waterline to which a vessel is legally allowed to load for voyages within geographical zones in summer months. Indicated by letter S on ship side.

Taffrail Log - A patent log towed from aft.

Trawler - A craft built for fishing or dredging by trawling. Generally has exceptionally high bows and low waist.

Trawl Gallows - Four strong fittings placed on both sides of trawler, generally formed by an H bar with bracket attachments to the deck.

Whaler - A ship built for whale catching. Generally has a low hull amidships, bulwarks forward, gangway linking bridge and stem, crow'snest at masthead, and harpoon gun at bow.

Wildcat - Cable holder, or sprocket wheel, of windlass.

Windlass - A special form of winch that works on a horizontal axis and is used for working cable. Usually has two sprocket wheels for holding cables and warping drums at extremities of shaft.

## ABBREVIATIONS AND SYMBOLS

AC	Alternating current
ADF	Automatic directional finder
AF	Audio frequency
AGB	Icebreaker; U.S.N. designation
AGOR	Research Ship, Oceanographic; U.S.N. designation
AGS	Surveying Ship; U.S.N. designation
AGSC	Coastal Surveying Ship; U.S.N. designation
AM	Amplitude modulation
amp.	Amperes
amp.-hrs.	Ampere hours
ANL	Amplitude noise limiting
Arg	Argentina
ARS	Salvage Ship; U.S.N. designation
ATA	Auxiliary Ocean Tug; U.S.N. designation
ATF	Fleet Ocean Tug; U.S.N. designation
Aus	Australia
AVP	Small Seaplane Tender; U.S.N. designation
Bel	Belgium
BHP	British horsepower
Br	Brazil
BT	Bathythermograph
BYMS	Coastal Minesweeper, Wooden; U.S.N. designation
Can	Canada
Chil	Chile
C.M.S.	Canadian Meteorological Station
C.N.A.V.	Canadian Naval Auxiliary Vessel
Co.	Company
Corp.	Corporation
c.p.s.	Cycles per second
cu. ft.	Cubic feet
cu. m.	Cubic meters
CW	Continuous wave
DC	Direct current
Den	Denmark
DF	Direction finder
EDO	U. S. Corporation, manufactures echosounders
ft.	Feet
Fin	Finland
FM	Frequency modulation
fms.	Fathoms
Fr	France



freq.	Frequency
F.R.V.	Fisheries Research Vessel
gal.	Gallons
GEK	Geomagnetic electro kinetograph
Ger	Germany (Federal Republic)
GM	General Motors Corporation
Gr	Greece
HP	Horsepower
hr.	Hour
hrs.	Hours
IHP	Indicated horsepower
in.	Inches
In	India
Indo	Indonesia
It	Italy
J	Japan
KC	Kilocycles
kg.	Kilograms
kt.	Knot
kts.	Knots
KV	Kilovolts
KVA	Kilovolt amperes
KW	Kilowatts
lab.	Laboratory
LCU	Utility Landing Craft; U.S.N. designation
LCVP	Landing Craft, Vehicle and Personnel; U.S.N. designation
LF	Low frequency
LSVP	Landing Ship, Vehicle and Personnel; U.S.N. designation
m.	Meters
MC	Megacycles
MF	Medium frequency
mfg.	Manufactured, manufacturer
min.	minutes
mm.	Millimeters
Mod.	Model
Mor	Morocco
MSC	Minesweeper, Coastal; U.S.N. designation
MSCO	Minesweeper, Coastal (Old); U. S. N. designation
MSTS	Military Sea Transportation Service
Neth	Netherlands
NIO	National Institute of Oceanography
Nor	Norway
NZ	New Zealand

Pak	Pakistan
PCS	Submarine Chaser (less than 136'); U.S.N. designation
PDR	Precision depth recorder
R	Receiver
RCA	Radio Corporation of America
r.p.m.	Revolutions per minute
SA	Union of South Africa
sec.	Second (s)
SHP	Shaft Horsepower
SIO	Scripps Institution of Oceanography
sq. ft.	Square feet
sq. m.	Square meters
SRT	Russian designation for "Typical Fishing Trawler"
SSB	Single Side Band
Sw	Sweden
T or trans.	Transmitter
T-AGOR	T, indicates vessel assigned to MSTs; U. S.N. designation
trans. or T.	Transmitter
Tur	Turkey
TV	Television
UHF	Ultra High Frequency
UK	United Kingdom
USA	United States of America
U.S.N.	United States Navy
USSR	Union of Soviet Socialist Republics
V	Volt
VHF	Very High Frequency
W	Watts
WAGB	Icebreaker; U. S. Coast Guard
WHOI	Woods Hole Oceanographic Institution
WT or W/T	Wireless Transmitter
YF	Covered Lighter (self-propelled); U.S.N. designation
Yug	Yugoslavia

## SYMBOLS

'	Feet
"	Inches
/	Per
%	Percent

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